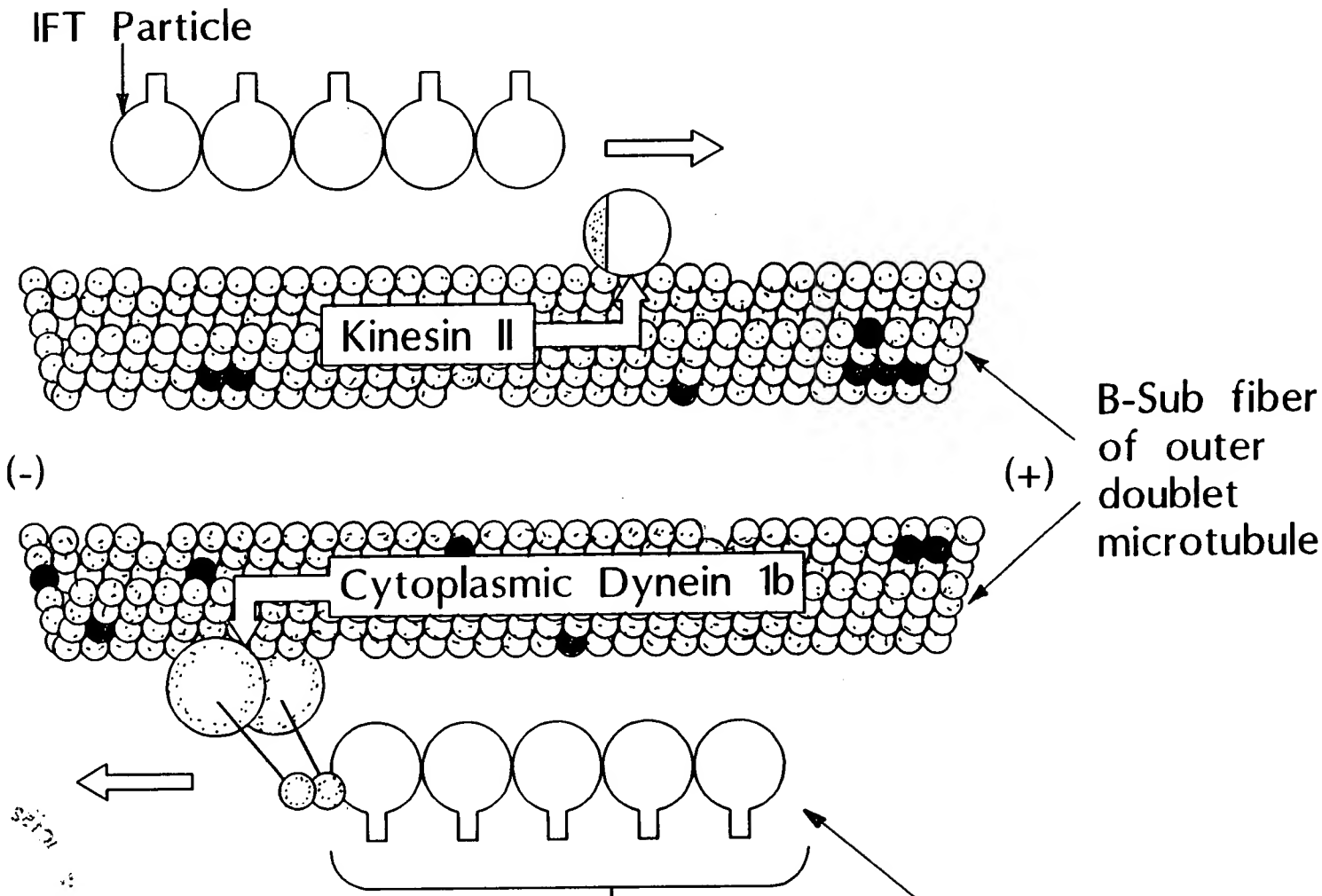
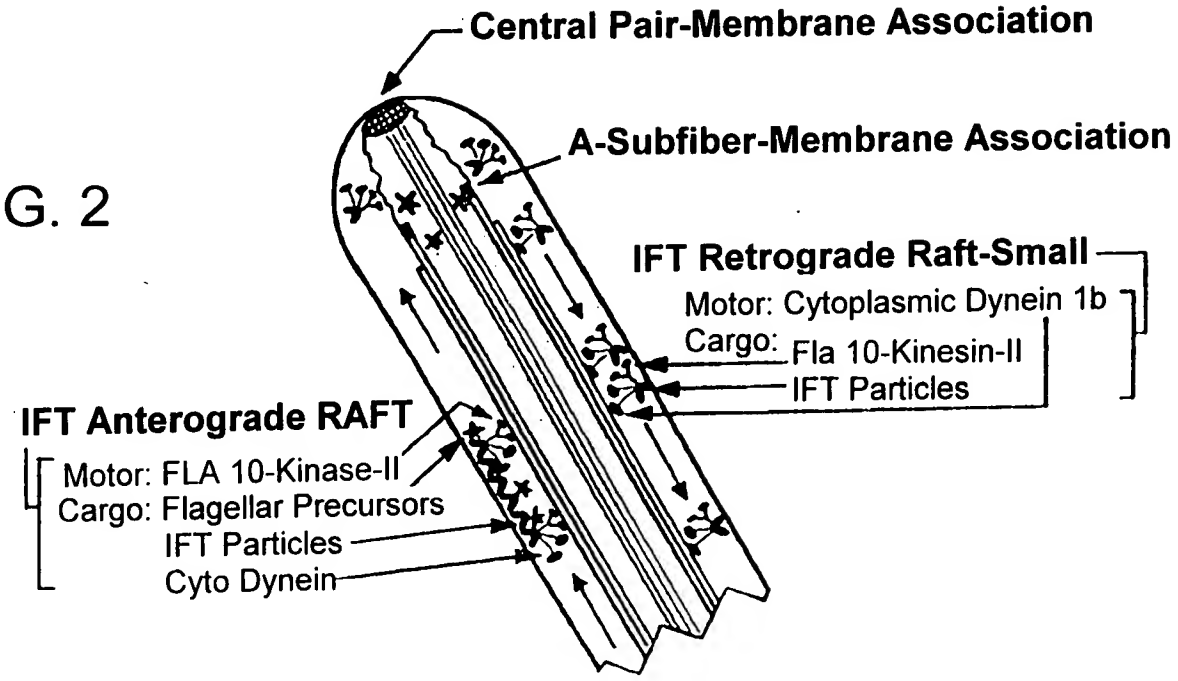


FIG. 1

FIG. 2



= IFT particle
= Heterotrimeric Kinesin II
= Cytoplamic Dynein 1b

Out / In = Pre-assembled axonemal proteins (radial spokes, dynein arms) Synthesized on free polysomes

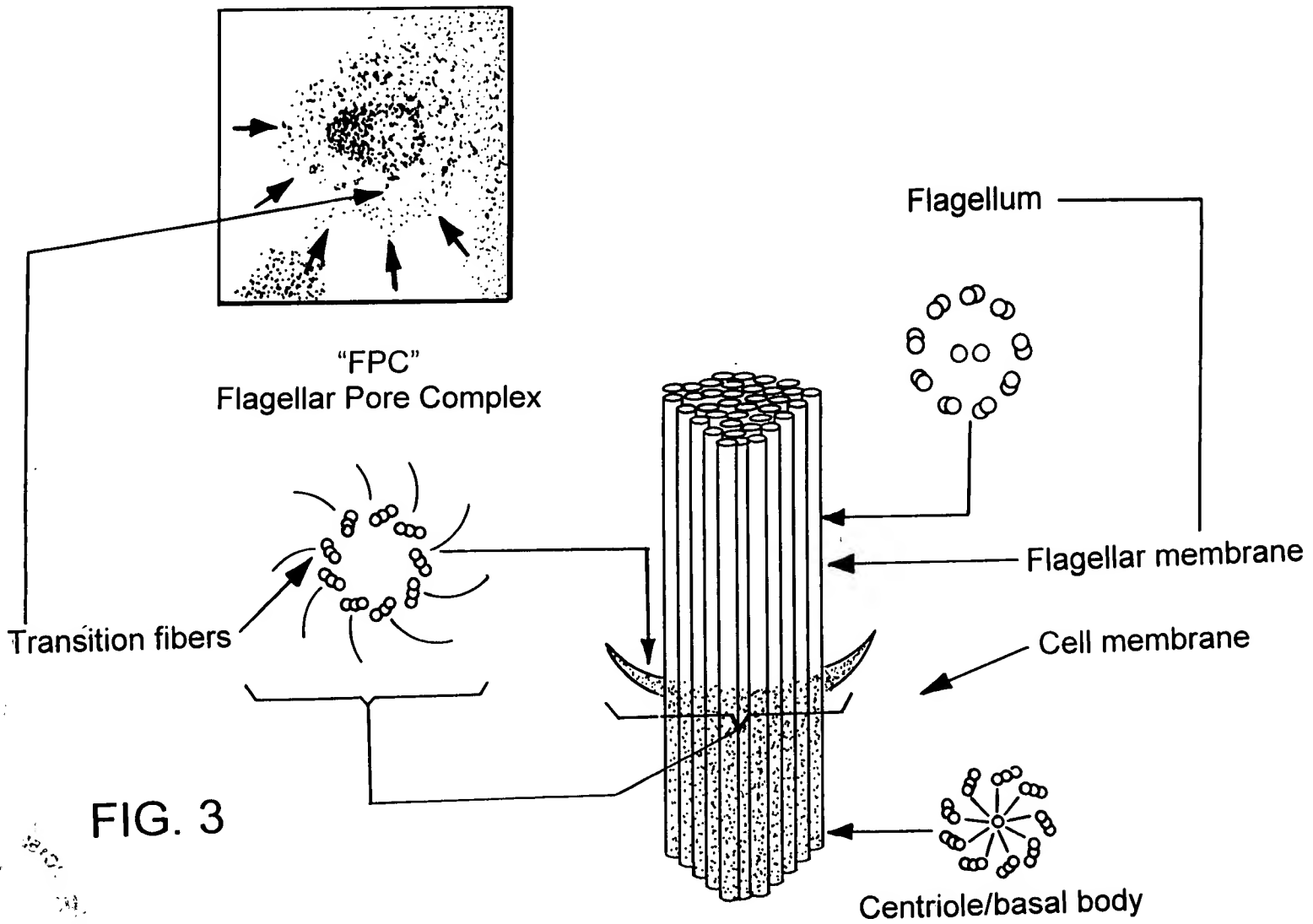
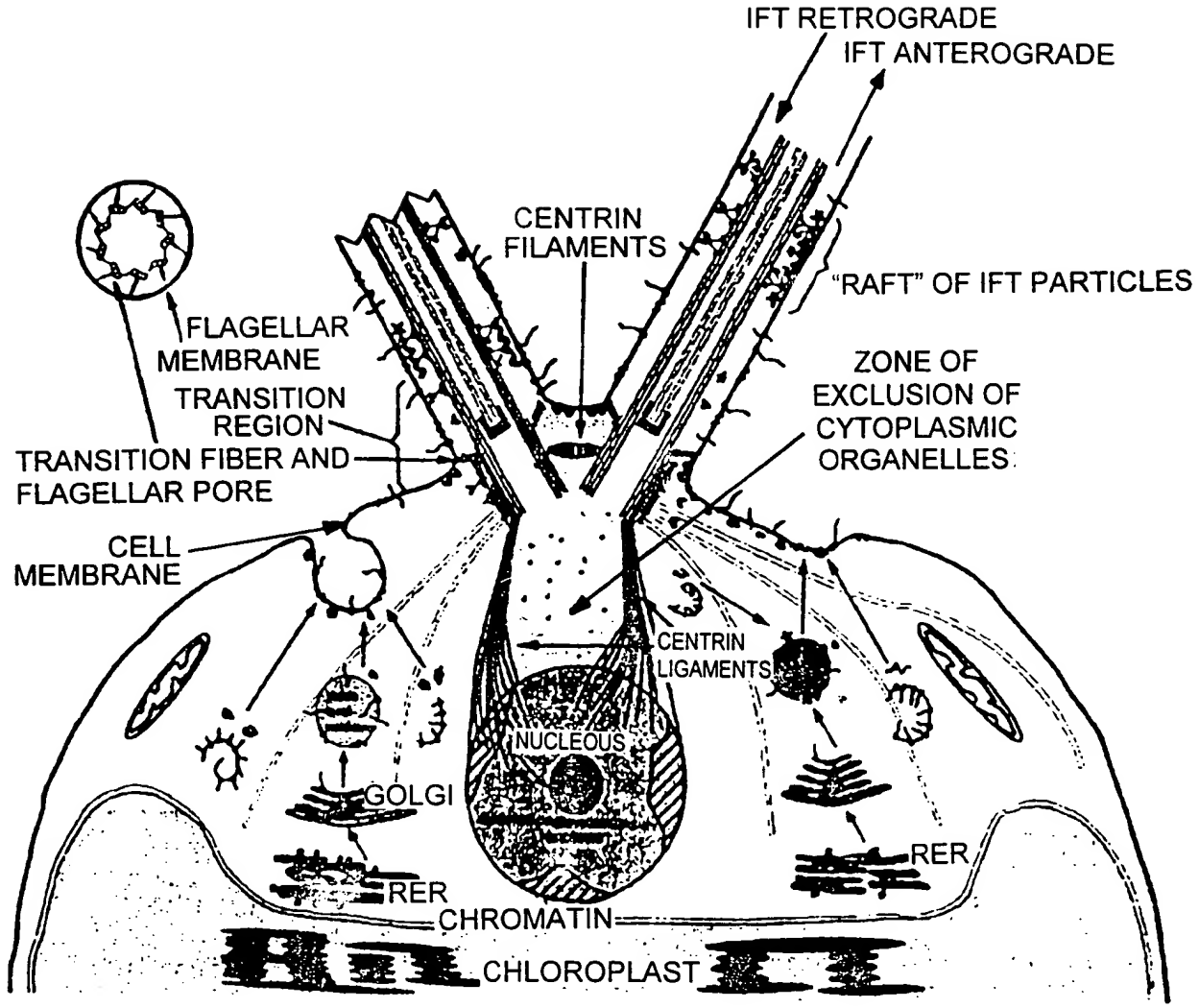

Flagellum
"FPC"
Flagellar Pore Complex
Flagellar membrane
Transition fibers
Cell membrane
Centriole/basal body

FIG. 3



= IFT particle
= Heterotrimeric Kinesin II
= Cytoplamic Dynein 1b
= Free Polysomes
= Microtubules

Out / In = Integral membrane proteins (Channels, etc.)(ER → Golgi)
Out / In = Pre-assembled axonemal proteins (radial spokes, dynein arms) Synthesized on free polysomes
Out / In = Peripheral membrane (protein (ER → Golgi)

FIG. 4

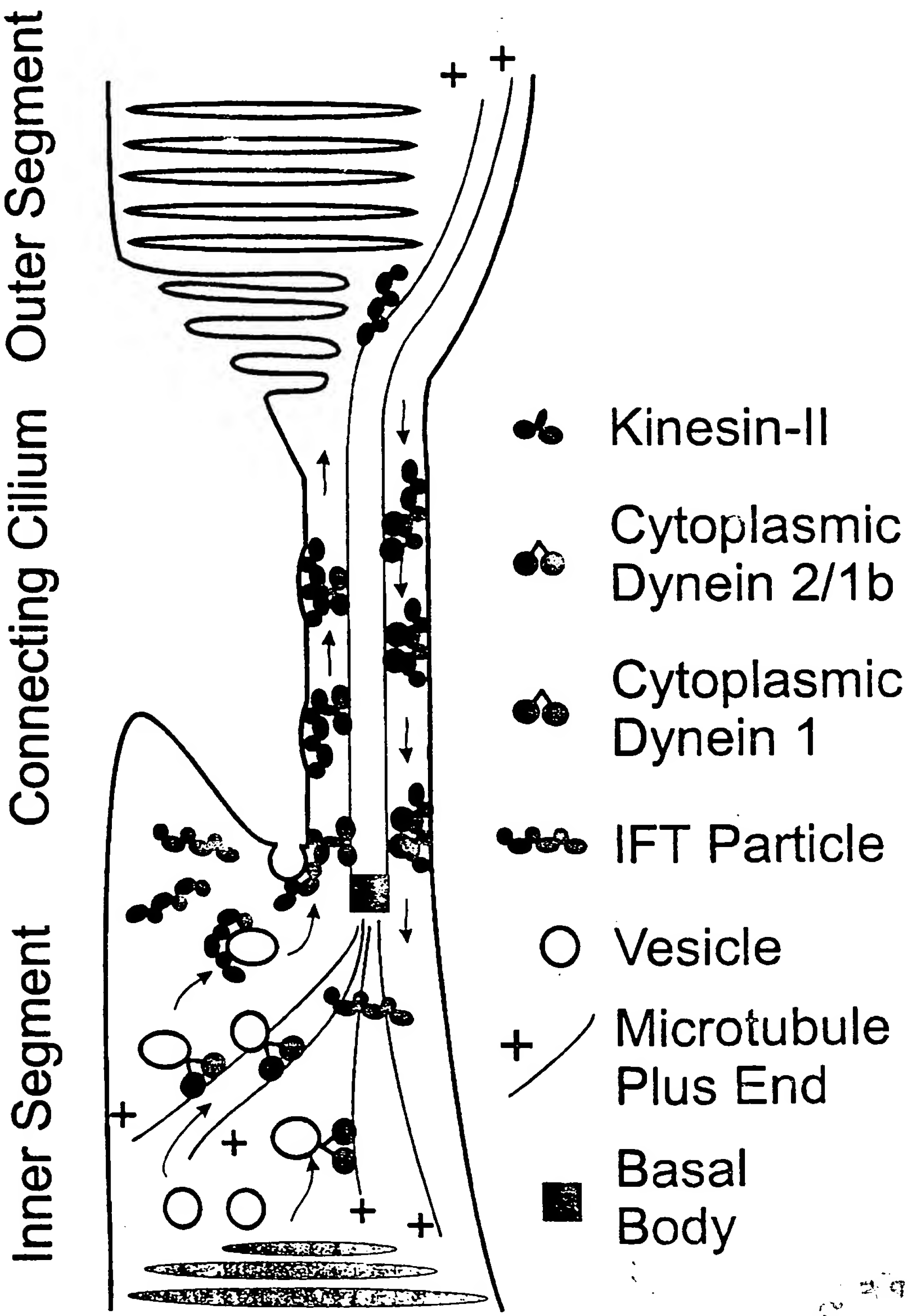


FIG. 5

IFT20

Chlamydomonas

>Cr_IFT20 predicted peptide
MDAVDRGVYFDEDFHVRILDVDKYNASKSLQDNTNVFINNIQNMQGLVDKYVSAIDQQVERLEA
EKLKAIGLRNRVAALSEERKRKQKEQERMLAEKQEELERLQMEEQSLIKVKGEQELMIQKLSDSS
SGAAYV (SEQ ID NO: 2)

FIG. 6A

>Cr_IFT20 cDNA
CACCGCTGCCGCTGAACAGAAAGTCTGCGCAGACTCGTCTTCTTGCCAAGTTCTTGCCAAAAC
CAGCAGGCCTAGAGGTTGCCTTAACCTAAATATACAAAACACAGAGCATCATGGACGCGGTA
GATAGAGGAGTCTACTTTGACGAGGACTTTCATGTCCGCATTCTTGATGTTGACAAGTACAAT
GCTTCAAAGTCGCTCCAGGACAACACAAATGTGTTCATTAACAACATCCAAAATATGCAAGGC
CTCGTGGACAAGTACGTGTCCGCCATCGACCAGCAGGTCGAGCGGCTAGAAGCTGAAAAGCT
GAAGGCCATTGGCCTGCGGAACCGGGTGGCTGCGCTGAGCGAGGAGCGGAAACGTAAACAA
AAGGAGCAGGAGCGCATGCTAGCGGAGAAGCAGGAGGAGCTTGAGAGGCTCCAAATGGAGG
AGCAGTCGCTGATCAAGGTGAAGGGCGAGCAGGAGCTCATGATTCAGAAGCTGTCGGACAGC
AGCAGCGGGGCGGCATACGTGTAAACGGTGTTCGGACGTCATGCGTGCAAAGGTAGTTTGCT
CTGTGAGGGTTGGCTGAGGCGGCGGAGGCTGCTATTGAGGCTGCAGCATGCGGTCTGGTGGC
AGATGTACATAACGGTATGGGGTGTTGGCGACAGAACGAAACGGCGAGGGTGCGCAAATGTC
GTGCAGAAGCGACGCTACAGCATCCATGGTACGTAGAGGCTTACTGGGTGTCAGTGCGTCGTC
CGCCACTGGGGACACACTTGCAGCGAGGAGCGCCATTGTTTGGCCCACGGATTGCGTCAAGG
ACTTGAACGGCGCCAGTGAAGGCGGGGAATGGAATGTAAACAAACGACTCGAAAAAAAAAA
AAAAAAAA (SEQ ID NO: 1)

FIG. 6B

Human

>Hs_IFT20-1 chr17 gb|AC002094.1|AC002094 [expressed]
MAKDILGEAGLHFDELNKLRVLDPEVTQQTIELKEECKDFVDKIGQFQKIVGGLIELVDQ
LAKEAENEKMKAIGARNLLKSIAKQREAQQQQLQALIAEKKMQLERYRVEYEALCKVEAE
QNEFIDQFIFQK (SEQ ID NO: 23)

FIG. 6C

> Hs_IFT20-2 EST gb|AA584846.1|AA584846
QDSLGEAGLCFDELSKVRDPEVT*QTRDPKEDCMDFVGKISPFQKEIVGGLIEPVDQLAKAAENEK
RKVVGAWNLLQFMAKHREAQQQQLLAQTAEEKMWLKRWWIEYE (SEQ ID NO: 24)

FIG. 6D

>Hs_IFT20-3 chr14 emb|AL121808.2|CNS01DSJ Human chromosome 14
MVKDILAEEGLHFDELNKLWVLDSEVTQQTTELKEECKNFADKTGQFQKTVGGLIELVDK
LAKKA*NAKMRAMVLR (SEQ ID NO: 25)

FIG. 6E

IFT27

Chlamydomonas

>Cr_IFT27 predicted peptide
MVKKEVKPIDITATLRCKVAVVGEATVGKSALISMFTSKGSKFLKDYAMTSG
VEVVVAPVTIPDTTVSVELFLLDTAGSDLYKEQISQYWNGVYYAILVFDVSSMESFESCK
AWFELLKSARPDRERPLRAVLVANKTDLPPQRHQVRLDMAQDWATTNTLDFFDVSANPPG
KDADAPFLSIATTFYRNYEDKVAAFQDACRNY (SEQ ID NO: 4)

FIG. 7A

>Cr_IFT27 cDNA sequence
ATGGTGAAGAAAGAAGTGAAGCCCATCGATATCACCGCAACGCTAAGATGCAAAGTAGCAGT
AGTCGGCGAAGCGACTGTCGGCAAGAGCGCGCTCATCTCTATGTTCACGAGTAAAGGCAGCA
AGTTTCTAAAGGACTATGCGATGACGAGTGGGGTGGAGGTGGTGGTAGCCCCGGTGACCATT
CCGGACACGACGGTCTCGGTGGAGCTCTTTCTGCTGGACACGGCGGGGAGCGACCTGTACAA
GGAGCAGATATCGCAGTACTGGAACGGCGTATACTACGCCATTCTCGTGTTCGATGTGAGCTC
TATGGAGTCCTTCGAGTCGTGCAAGGCGTGGTTTGAGCTGCTCAAATCGGCGCGTCCCGACCG
CGAGCGGCCGCTGCGCGCCGTGCTGGTGGCGAACAAGACGGACCTTCCGCCGCAGCGGCACC
AGGTGCGGCTGGACATGGCGCAGGACTGGGCCACCACCAACACCCTCGACTTCTTCGACGTGT
CCGCGAACCCGCCCGGCAAGGACGCGGATGCGCCGTTCCTGTCCATCGCCACCACCTTCTACC
GCAACTACGAGGACAAGGTGGCGGCCTTCCAGGACGCTTGCCGCAACTACTGA

(SEQ ID NO: 3)

FIG. 7B

Human

>Hs_IFT27 gi|12653581|gb|AAH00566.1|AAH00566 putative GTP-binding protein
MVKLAAKCILAGDPAVGKTALAQIFRSDGAIFQKSYTLTTGMDLVVKTVPVPDTGDSVELFIFDS
AGKELFSEMLDKLWESPNVLCLVYDVTNEESFNNCSKWLEKARSQAPGISLPGVLVGNKTDLAG
RRAVDSAEARAWALGQGLECFETSVKEMENFEAPFHCLAKQFHQLYREKVEVFRALA

(SEQ ID NO: 26)

FIG. 7C

IFT46

Chlamydomonas

>Cr_IFT46 predicted peptide sequence
MDDSMDYPDRDGDDLDQFQGTARSQVVQNQPHDEEVNLSESESFAGADE
PPAAPRDASLIESHDMDEGPAAPARTLSPTGYEAGKHAPGGIANSDEAPPGAYNAQEYKH
LNVGEDVRELFSYIGRYKPQTVELDTRIKPFIPDYIPAVGGIDEFIKVPRPDTKPDYLGL
KVLDEPAAKQSDPTVLTLQLRQLSKEAPGAKADMVGRLEHTDENKAKKIQQWIASINDIH
KAKPAATVNYSKRMPEIEALMQEWPPEVETFLKTMHMPSGDVELDIKTYARLVCTLLDIP
VYDDPVESLHVLFTLYLEFKNNPIFRQHMEMENKLDGMSGGGGGMMGGGADVLGL

(SEQ ID NO: 6)

FIG. 8A

>Cr_IFT46 cDNA sequence
ATGGATGACTCTATGGACTACCCTGACCGCGACGGGGACGACCTGGACCAGTTCCAGGGCAC
CGCGCGCTCGCAGGTCGTGCAGAACCAGCCGCACGACGAGGAGGTGAACCTGAGTGAGTCGG
AGAGCTTCGCGGGAGCGGATGAGCCTCCAGCTGCGCCTAGAGATGCGTCGCTCATAGAGTCA
CACGACATGGACGAGGGGCCAGCTGCTCCAGCGCGGACACTCTCACCAACGGGCTATGAGGC
TGGAAAGCACGCACCTGGCGGCATCGCCAACTCGGACGAGGCACCGCCGGGTGCTTACAACG
CACAGGAGTACAAGCACCTGAACGTGGGCGAGGACGTGCGCGAGCTGTTCTCCTACATCGGC
CGCTACAAGCCGCAGACGGTGGAGCTGGACACGCGCATCAAGCCCTTCATCCCTGACTACATC
CCCGCGGTGGGCGGCATCGACGAGTTCATCAAGGTGCCGCGACCCGACACCAAGCCCGACTA
CCTGGGGCTCAAGGTTCTGGACGAGCCGGCCGCCAAGCAGTCGGACCCCACGGTGCTGACGC
TGCAGCTGCGGCAGCTGTCCAAGGAGGCGCCGGGCGCCAAGGCCGACATGGTGGGGCGGCTG
GAGCACACCGACGAGAACAAGGCCAAGAAGATCCAGCAGTGGATCGCCTCCATCAACGACAT
CCACAAGGCCAAGCCGGCCGCCACCGTCAACTACAGCAAGCGCATGCCAGAGATCGAGGCGC
TGATGCAGGAGTGGCCGCCGGAGGTGGAGACCTTCCTCAAGACCATGCACATGCCGTCCGGC
GATGTGGAGCTGGACATCAAGACCTACGCCCGGCTGGTGTGCACGCTGCTGGACATTCCCGTG
TACGACGACCCCGTGGAGAGCCTGCACGTGCTGTTCACACTGTACCTGGAGTTCAAGAACAAC
CCCATCTTCAGGCAGCACATGGAGATGGAGAACAAGCTGGACGGCATGTCGGGCGGCGGCGG
CGGCATGATGGGCGGCGGCGCGGATGTGCTGGGCTTGTGA (SEQ ID NO: 5)

FIG. 8B

Human

>Hs_IFT46 gi|8926685|emb|CAB96537.1| hypothetical protein [Homo sapiens]
MADNSSDECEEENNKEKKKTSQLTPQRGFSENEDDDDDDDDSSETDSDSDDDDEEHGAPLEGAY
DPADYEHLPVSAEIKELFQYISRYTPQLIDLDHKLKPFIPDFIPAVGDIDAFLKVPRPDGKPDNLGLL
VLDEPSTKQSDPTVLSLWLTENSKQHNITQHMKVKSLEDAEKNPKAIDTWIESISELHRSKPPATV
HYTRPMPDIDTLMQEWSPEFEELLGKVSLPTAEIDCSLAEYIDMICAILDIPVYKSRIQSLHLLFSLYS
EFKNSQHFKALAEGKKAFTPSSNSTSQAGDMETLTFS (SEQ ID NO: 7)

FIG. 8C

IFT52

<u>*Chlamydomonas*</u>

>Cr_IFT52 predicted peptide sequence
MEEPGAEEVRILFSTAKGESHTHKAGFKQLFRRLRSTYRPDKVDKDDFTLDTLRSAHILVLGGPKE
KFTAPEVDMLKKFVKNGGSILILMSEGGEEKAGTNINYFLEQFGMSVNNDAVVRTTHYKYLHPKE
VLISDGILNRAVITGAGKSLNSNDDDEFRVSRGPQAFDGTGLEYVFPFGATLSVQKPAVPVLSSGKI
AYPMNRPVGAVWAQPGYGRIAVLGSCAMFDDKWLDKEENSKIMDFFFKFLEPHSKIQLNDIDAEE
PDVSDLKLLPDTASLADKLKGCLQEIDDVPRDWTSLFDDSLFKFDTGLIPEAVSLYEKLGVKKGQL
NLIPPSFETPLPPLQPAVFPPTIREPPPPALELFDLDESFASETNRLASLTNKCHGEEDLEYYIMEAGH
ILGLKLQENANAKHVLSEVFRRIAQYKMGSLGLGQTLDSMGQTLPAANQFGDQFEL

(SEQ ID NO: 8)

FIG. 9A

>*Chlamydomonas* cDNA sequence

CTAATGGCATGCAGTAAGGCACTGGTATAGAAACCGTTCCCACCGCCGCGCCCAGCCCCGCGT
CCTGTGAGCTGAGAGCTACTTAACAGCCATGGAGGAGCCGGGCGCGGAGGAGGTTCGGATTC
TCTTCAGCACAGCGAAGGGGGAATCCCATACGCACAAGGCAGGCTTCAAGCAGCTATTTCGA
CGATTGCGTTCAACTTATCGTCCAGACAAAGTAGATAAGGATGACTTCACGCTGGACACGCTG
CGGTCAGCGCACATCCTTGTGCTCGGTGGCCCGAAGGAGAAGTTCACCGCGCCTGAGGTGGA
CATGCTCAAAAAGTTCGTGAAGAATGGTGGCTCCATCCTCATTCTAATGTCGGAGGGCGGCGA
GGAGAAGGCGGGCACTAACATCAACTACTTCCTCGAGCAGTTTGGCATGTCGGTGAACAACG
ACGCCGTGGTCCGCACCACGCACTACAAGTACCTGCACCCCAAGGAGGTGCTCATCTCGGACG
GCATCCTCAACCGGGCGGTGATCACGGGCGCGGGGAAGTCGCTGAACAGCAACGACGACGAC
GAGTTCCGCGTGTCGCGGGGGCCGCAGGCTTTTGATGGCACGGGCCTGGAGTACGTCTTCCCC
TTCGGTGCCACGCTCTCAGTGCAGAAGCCCGCGGTGCCCGTCTTGTCCAGCGGCAAAATCGCG
TACCCCATGAACCGGCCAGTGGGTGCGGTATGGGCGCAGCCCGGCTACGGCCGCATCGCCGT
GCTGGGCTCGTGCGCCATGTTTGACGACAAGTGGCTGGACAAGGAGGAGAACTCCAAAATCA
TGGACTTCTTCTTCAAGTTCCTCGAGCCGCATTCCAAAATCCAACTCAACGACATTGACGCGG
AGGAGCCGGACGTGAGCGACCTGAAGCTGCTGCCCGACACAGCCAGTCTGGCAGACAAGCTG
AAGGGCTGCCTCCAGGAGATCGACGACGTGCCGCGCGACTGGACCTCGCTGTTCGACGACTC
GCTGTTCAAGTTCGACACCGGCCTCATCCCTGAGGCCGTGTCGCTGTACGAGAAGCTGGGCGT
GAAGAAGGGGCAGCTGAACCTCATCCCGCCCTCCTTCGAGACGCCACTGCCGCCGCTGCAGCC
CGCCGTGTTCCCGCCCACCATCCGTGAGCCGCCGCCGCCGGCGCTGGAGCTGTTCGACCTGGA
TGAGAGCTTTGCCAGCGAGACGAACCGGCTGGCCTCGCTCACCAACAAGTGCCACGGCGAGG
AGGACCTGGAGTACTACATCATGGAGGCGGGCCACATCCTGGGCCTCAAGCTGCAGGAGAAC
GCCAACGCCAAGCACGTGCTGTCGGAGGTGTTCCGCCGCATCGCGCAGTACAAGATGGGCAG
CCTGGGCCTGGGCCAGACGCTGGACTCCATGGGCCAGACCCTGCCCGCGGCCAACCAGTTCG
GCGACCAGTTCGAGCTGTAAGGAGCAGCGAGCTACAGGCCGAGCAACTGCGTGGCAGGCGGC
AGGGCGGGCGCTGGCTGCGGCGGAGGCCGAGGCGGGGGCGGCTGGCCTGGGAATGCTGCTGG
CAGCGGATGTGGAAACGTGGGGCGCCGCAGCTGCTGGAGCTGAGGCGGTTCGGGGCTGGCTG
CTGGCGTGCTGGCAGCAGGATGTGCGCTTGTGCTGATGCGGTCAGCGGAGCAGCGGGCATGC
TGGGCTGCTGAACAGAGCCACGCGGGAGGGTGTGCGGCGCGCCAACGGCAGCAGCATGCTGC
ACGCGGGGTTGTGGCCTGGCGGCGAAAAGCTGGGCATTCACCGGTGCCTCCTCTGAAAGGCG
GCTGGGCTTGGCACCGCGTGTGCCGCTTGCGGTGTGCTGGGTGTACTGGTTTCACGCGTTCTCC
AGTCTGATGAGAGGAGCCTTTATCGGATTGACAATGGTCCATGGTGAACGATGGATTATGGAT
ATCGGAGTGCACAGAGGCTGACAAGATAACGTTACAGTCCAGGAGATATGTGGTGGTAGCTG
CAGCAACTACAAGATGGCGTCAGTCAGACCCGACCTGTTTTGAGTGCTGCAGGCTGACACGCA
TGCTGACAGAACAGACGCCGCTGCAATTGCGGTTGATATTTTAGCCAGAAGGCAATATGTGGG
TGTATGCGGGGGGTGGCATGAGGCGCGCGAGTGGAGGAGTACAGGGCTGCGTCGGGCGTGCG
CGTCTGCGGTTGCAACAGTGAGCTGTGTTGGGTGTGCAAGGTGGTGGGCGTGTGCATGGAGCC
GTGTGGAGCAGTGTTCCCGTGGCGCTCAAGCGGCCCAGCATTCACTAAGCTCACGTGTAAAAC
TCATTGCGGCTGAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

(SEQ ID NO: 7)

FIG. 9B

Human

>Hs_IFT52 gi|4929575|gb|AAD34048.1|AF151811_1 CGI-53 protein [Homo sapiens]
MEKELRSTILFNAYKKEIFTTNNGYKSMQKKLRSNWKIQSLKDEITSEKLNGVKLWITAGPREKFT
AAEFEILKKYLDTGGDVLVMLGEGGESRFDTNINFLLEEYGIMVNNDAVVRNVYHKYFHPKEAL
VSSGVLNREISRAAGKAVLAIIDEESSGNNAQALTFVYPFGATLSVMKPAVAVLSTGSVCFPLNRPI
LAFYHSKNQGGKLAVLGSCHMFSDQYLDKEENSKIMDVVVFQWLTTGDIHLNQIDAEDPEISDY
MMLPYTATLSKRNRECLQESDEIPRDFTTLFDLSIFQLDTTSFHSVIEAHEQLNVKHEPLQLIQPQFE
TPLPTLQPAVFPPSFRELPPPPLELFDLDETFSSEKARLAQITNKCTEEDLEFYVRKCGDILGVTSKLP
KDQQDAKHILEHVFFQVVEFKKLNQEHDIDTSETAFQNNF (SEQ ID NO: 28)

FIG. 9C

Caenorhabditis elegans

>Ce_Osm-6 gi|2292823|emb|CAA03975.1| osm-6 [Caenorhabditis elegans]
MPPFSDEKMTNRSIGRKVLIDQSKQQQISLISGFRGVARHLKSVLTVEINTEPINLNGLEDVRMLIIP
QPKTSFGTGEIEAIWKFVEEGGSLMILSGEGGERQSLNEMIAKYGITVNKDSVIRTVFLKYFDPKEA
LVANGVINRAIAVAAKKNVSTEQKHNSQALSFIYPYGCTLDVNNRMSNVVLSSGSTSFPTSRPVAA
FHETKLNEMKKKGRVCVVGSVSMFHDTYIDKEENGKIFDTFVEFLVNGLELNTIDAAEPEINDYTN
IPDHIHMSQQIKVCMYEGELDQAISSDFMKIMDTSLHSFNLKHWPMTIRLYEALNLSPPPLTLVEPQ
FELPMPPFQPAVFPPTFQELPMPPLELFDLDEQFSSPEIQLSQLANRSEEEDLIFFIEKAGEITGISAEL
TRSERTPKKIIELAVSKLMLFKRSMMDGELEVASAFDIGEHDAHHQSFNQGEEMDEQLFSDIDEFD
DL (SEQ ID NO: 29)

FIG. 9D

IFT57

Chlamydomonas

>Cr_IFT57 predicted peptide sequence
MSSKRGGRSSLAKAPEEAVNGEAFAPEASPPPPGDDGDAGGEDGGAPAPPPPPATKGGPVAVGRS
LEIQTTPDVCMEMLADKLKLLNYEADFCRKKKPYRKPLSRLYFAVPLANSSEQFFYFTSLATWLL
GLAGVELPAPKEFDDPNLTCQNILGAVKKLGFAPPSYHPTKLTVGNGKEVVGVLDGLVDFVLERR
HHKYSRPAYGNDGQPEEGVQLDDEAEAAAMEGADELAMPAQNQADDDEEEEGVYVDPGRGDA
AGPGTGASAAMDAEKAVLVSKVDPTLWKIELERVAPKLRITIAADSKDWRSHLDEAHQHKEVISK
AWPDSKTSLERLRADLNGTLEKLQTREKFLNEQFESLMQQYRAARTTFTDVQETYNRKTEAVAD
RNQEMHRIGETLEEVKAMMDEKGSNIADATPVARIKTAIKQLNKELHDMEVRIGVVSHTLLQLSL
RNKRLLQAQAALSDEEED (SEQ ID NO: 10)

FIG. 10A

>Cr_IFT57 cDNA sequence
GTCTTGGGAACCCAGCGAGCCGCGCTCCTTGCCACATGTCCTGCTAGCTTCTGGTTTACACCGT
AGATTCATTTAAGCGAGAGACATGAGCAGCAAGCGGGGTGGGCGGTCATCCTTAGCAAAGGC
GCCCGAAGAGGCGGTAAATGGCGAGGCATTTGCGCCTGAGGCATCTCCCCCTCCACCCGGCG
ACGATGGAGATGCTGGTGGGGAGGACGGTGGCGCGCCTGCGCCCCCTCCGCCCCCGGCTACA
AAGGGCGGTCCAGTAGCTGTAGGAAGGTCGCTGGAGATACAAACAACGCCGGACGTGTGCAT
GGAAATGCTGGCCGACAAGCTGAAGCTGCTAAACTACGAGGCGGATTTCTGCAGGAAGAAGA
AGCCCTACCGGAAACCCCTCTCGCGGCTCTATTTTGCGGTGCCGCTCGCAAACTCGAGCGAGC
AGTTCTTCTACTTTACCAGTCTGGCGACCTGGCTGCTGGGCCTGGCTGGCGTGGAGCTGCCCG
CTCCCAAGGAGTTTGATGACCCGAACTTGACGTGCCAGAACATCCTGGGTGCGGTGAAGAAG
CTGGGCTTTGCGCCGCCCAGCTACCACCCTACCAAGCTCACAGTGGGCAACGGCAAGGAGGT
GGTGGGTGTGCTGGACGGGCTGGTGGACTTCGTGCTGGAGCGGCGGCACCACAAGTACAGCC
GGCCCGCGTACGGAAATGATGGGCAACCGGAGGAGGGCGTGCAACTGGACGATGAGGCGGA
GGCTGCCGCGATGGAGGGTGCGGATGAGCTGGCGATGCCAGCCCAGAACCAGGCGGATGACG
ATGAGGAGGAGGAGGGCGTATACGTGGACCCGGGGCGCGGTGACGCCGCGGGCCCAGGGAC
AGGGGCATCCGCGGCGATGGACGCGGAGAAGGCGGTGCTTGTGTCCAAGGTGGACCCCACGC
TCTGGAAGATCGAGCTGGAGCGCGTGGCGCCGAAGCTGCGTATCACCATCGCCGCCGACTCG
AAGGACTGGCGCTCACATCTGGATGAGGCGCACCAGCACAAGGAGGTGATCAGCAAGGCCTG
GCCCGACAGCAAGACGTCGCTGGAGCGCCTGCGTGCGGACCTGAACGGCACGCTGGAGAAGC
TGCAGACGCGTGAGAAGTTCCTCAACGAGCAGTTTGAGAGCCTCATGCAGCAGTACCGCGCC
GCCCGCACCACGTTCACGGACGTGCAGGAGACATACAACCGCAAGACGGAGGCGGTGGCGGA
CCGGAACCAGGAGATGCACCGCATCGGCGAGACGCTGGAGGAGGTGAAGGCCATGATGGAC
GAGAAGGGCAGCAACATCGCGGACGCCACGCCTGTGGCTCGCATCAAGACCGCCATCAAGCA
GCTTAACAAGGAGCTGCACGACATGGAGGTGCGCATCGGCGTGGTTAGCCACACGCTGCTGC
AGCTATCGCTGCGCAACAAGCGATTGCTGCAGGCGCAGGCGGCTCTCAGTGACGAGGAGGAG
GACTAGCTAGATCAGCGAGTGACAGAGGGCATGTGTGCGTACCGTGTGCGCGGGTACAGCCG
TGGGATGGAAGAGGTGATGTGGCGGGTTGCGGACCCAGCATTCGGTAGACCAGATCACTTAT
AGGTACAGAAAGACGGCTATATTGTTGGGGGCGGCGCACCCTGGCTATGTATATACAAGCCG
TAGCGCAGAGCCGCTGCAAATGCGGTGCTGTGCCTGTGCTCCCGTGGGTGTGCGGCGTTCCGG
TCAAGTTCATATAAGCTGTTGTGACTTGTGAGGCAGGCATGGCATATGGACAGGGCATCCCTG
CAAGGAAAGCAGGCAGCGGTATCCTTGTGGCGATGGGTCAAGCAGTGATGGAGGGGCGAAGC
GAGTTGCGGGCCTGTAAGCACAGGGTTGCCAAAAAAAAA (SEQ ID NO: 9)

FIG. 10B

Mouse

>Mm_IFT57 predicted peptide sequence
MAAAAAVIPPSGLDDGVSRARGEGAGEAVVERGPGAAYHMFVVMEDLVEKLKLLRYEEELLRK
SNLKPPSRHYFALPTNPGEQFYMFCTLAAWLINKTGRAFEQPQEYDDPNATISNILSELRSFGRTAD
FPPSKLKSGYGEQVCYVLDCLAEEALKYIGFTWKRPSYPVEELEEETVPEDDAELTLSKVDEEFVE
EETDNEENFIDLNVLKAQTYRLDTNESAKQEDILESTTDAAEWSLEVERVLPQLKVTIRTDNKDW
RIHVDQMHQHKSGIESALKETKGFLDKLHNEISRTLEKIGSREKYINNQLEHLVQEYRGAQAQLSE
ARERYQQGNGGVTERTRLLSEVTEELEKVKQEMEEKGSSMTDGTPLVKIKQSLTKLKQETVQMDI
RIGVVEHTLLQSKLKEKCNMTRDMHAAVTPESAIGFY (SEQ ID NO: 12)

FIG. 10C

>MmIFT57 cDNA sequence
GCGAAGGCTGCAGAGATCCTGGCCGGAGCCCAGCCGGGCGCTGGGGG
TCTGAGCAGGGATGGCCGCCGCGGCCGCGGTGATCCCGCCGTCGGGCTTGGACGATGGGGTG
TCTCGGGCTCGCGGGGAAGGCGCAGGGGAGGCTGTGGTGGAGCGCGGGCCAGGAGCGGCCTA
CCACATGTTCGTGGTGATGGAAGACTTAGTGGAGAAGCTGAAGCTGCTCCGCTACGAGGAGG
AGCTACTCCGAAAGAGCAATCTGAAGCCCCCGTCCAGACACTACTTTGCTCTGCCTACCAACC
CAGGCGAGCAGTTCTACATGTTTTGCACTCTTGCTGCGTGGCTGATCAACAAAACTGGCCGTG
CCTTTGAGCAGCCTCAAGAATACGACGATCCCAATGCAACTATATCTAATATACTCTCTGAGC
TTCGCTCTTTTGGGAGAACTGCAGATTTTCCTCCTTCAAAATTAAAGTCTGGTTACGGAGAACA
AGTGTGCTATGTTCTTGATTGCTTAGCTGAAGAAGCTTTAAAATATATTGGTTTCACTTGGAAA
AGGCCATCATACCCAGTGGAAGAACTAGAAGAAGAAACTGTTCCAGAAGATGATGCCGAGTT
AACATTAAGTAAAGTGGATGAAGAATTTGTGGAAGAGGAGACAGATAATGAAGAAAACTTTA
TTGATCTCAACGTTTTAAAGGCCCAGACCTATCGCTTGGACACAAACGAGTCTGCCAAACAAG
AAGATATTTTGGAATCTACGACAGATGCTGCGGAATGGAGCCTAGAAGTTGAGCGTGTACTAC
CGCAGCTGAAAGTCACGATTAGGACTGACAATAAGGATTGGAGGATCCATGTTGACCAAATG
CACCAGCACAAAAGTGGGATTGAATCTGCTCTGAAGGAGACCAAGGGGTTTTTGGACAAGCT
CCATAATGAAATTAGCAGGACTCTGGAAAAGATTGGCAGCCGAGAAAAGTACATTAACAATC
AACTTGAGCACTTGGTTCAAGAATATCGTGGGGCCCAAGCCCAGCTAAGTGAGGCAAGGGAG
CGCTACCAGCAGGGCAATGGCGGAGTAACTGAACGGACCAGACTCCTCTCTGAGGTTACAGA
AGAATTAGAAAAGGTAAAGCAAGAAATGGAAGAGAAGGGCAGCAGCATGACGGACGGCACT
CCTTTGGTGAAGATTAAGCAGAGCTTAACCAAGCTGAAGCAAGAAACTGTTCAGATGGACAT
TAGAATCGGTGTGGTGGAGCACACGCTACTTCAGTCAAAACTCAAGGAGAAGTGCAACATGA
CCAGGGACATGCATGCAGCTGTCACCCCAGAGTCAGCAATTGGCTTCTATTAAACACGTGGGC
TTCCATGCTTCTGATTATTTCGTTTTTATATCAAATGATTTTTTAATGTTGCATTGATTTCCAAA
CACAATTTATACTTCTTCAAGCATATTCAGTGGGTATTTTTGCACATGTGTTAATATCATGGTG
ATTATGATGGCCAAAGCCTGTACAATGAATATAGTATTTAATAAAGTACTTAAAATTAAAAAA
AAAAAAAAA (SEQ ID NO: 11)

FIG. 10D

Human

>Hs_IFT57-1 gi|7022022|dbj|BAA91466.1| unnamed protein product [Homo sapiens]
MTAALAVVTTSGLEDGVPRSRGEGTGEVVLERGPGAAYHMFVVMEDLVEKLKLLRYEEEFLRKS
NLKAPSRHYFALPTNPGEQFYMFCTLAAWLINKAGRPFEQPQEYDDPNATISNILSELRSFGRTADF
PPSKLKSGYGEHVCYVLDCFAEEALKYIGFTWKRPIYPVEELEEESVAEDDAELTLNKVDEEFVEE
ETDNEENFIDLNVLKAQTYHLDMNETAKQEDILESTTDAAEWSLEVERVLPQLKVTIRTDNKDWR
IHVDQMHQHRSGIESALKETKGFLDKLHNEITRTLEKISSREKYINNQLENLVQEYRAAQAQLSEA
KERYQQGNGGVTERTRLLSEVMEELEKVKQEMEEKGSSMTDGAPLVKIKQSLTKLKQETVEMDI
RIGIVEHTLLQSKLKEKSNMTRNMHATVIPEPATGFY (SEQ ID NO: 30)

FIG. 10E

>Hs_IFT57-2 chromosome 12 [ESTS BF089172]
DQRIHVDQMYQHKSGIESSLKESKRFFDKLHNE
ISKTLEKISHCEKYINHQLEHRVQEYPAAQTQLSDVRSQQGSGGVIERTRLLSEATED
TEHVKLEMEEKCSSMTDGDSLVKIKQSLTKLKQETVQMDIRIGVVEHTLL (SEQ ID NO: 31)

FIG. 10F

Caenorhabditis elegans

>Ce_IFT57 gi|7504754|pir||T22994 hypothetical protein F59C6.9 - Caenorhabditis elegans
MLHHIKSLKSVLSRGQEGRFGEKRHSNTTFITGIATDFTAAKLKSGAGENVIFILNSLADASLVHVG
FQWQKMIPPKEEDEDTAVDEQDEDDDNDDIVEEPMNFLDDDDDDNVIEIDLKAQGLATESKNPLQ
SVLQSNTDAITWKQEVERVAPQLKITLKQDAKDWRLHLEQMNSMHKNVEQKVGNVGPYLDNMS
KDIAKALERIASREKSLNSQLASMMSKFRRATDTRAELREKYKAASVGVSSRTETLDRISDDIEQL
KQQIEEQGAKSSDGAPLVKIKQAVSKLEEELQTMNVQIGVFEQSILNTYLRDHFNFSANLLNIM

(SEQ ID NO: 32)

FIG. 10G

IFT72

Chlamydomonas

>Cr_IFT72 partial predicted peptide sequence (lacking N-terminal end)
VYVIQQEFAALKDRNEQQRKRVDEVLTERLNLESKAKQAESK
MSEIQASMDQRLNSMPPSQRNEYTTLVAEQQQLQADSKRFEEVLDELDKALQASEGELAR
NPFKQRSLQLQEQIRALTGKKYELTEEERQSKRSPEELRADLMAKIKRDNTEVEQMTQQI
RELQDQIKKMEERVKSLGGATSGAVAAEEKANREKFEELLAKERHLNNFMDGFPSRKAAK
MQEKQQKEDGIVGVLEKMVKMQGIIGSNLPSQKKYKEMQDELEYKKMQLENTQTTQERLK
EELTMRRTELEKIDTLEDKIKLELTQLAERQEAMEKEMGEFGSVEDIQRKANAARERMGA
CAVCCLKRKDLLRSIVAERGLKFQAKRAQLQDHNLQVQLEKMEAKLKNLSAGVFEMDEFI
KAKESETNYRQLASNIAALVDDLNVHVKKAVV (SEQ ID NO: 14)

FIG. 11A

>Cr_IFT72 partial Cdna sequence (lacking 5' end)
GTGTACGTGATCCAGCAGGAGTTCGCGGCGCTCAAGGACCGCAACGAGCAGCAGCGCAAGCG
CGTGGACGAGGTGCTCACGGAGCGCCTCAACCTCGAGTCCAAGGCCAAGCAGGCCGAGTCCA
AGATGTCTGAGATCCAGGCGTCCATGGACCAGCGCCTCAACTCTATGCCGCCCAGCCAGCGCA
ACGAATACACCACGCTCGTGGCCGAGCAGCAGCAGCTGCAGGCCGACAGCAAGCGCTTTGAG
GAGGTGCTGGACGAGCTGGACAAGGCGCTGCAGGCCAGCGAGGGCGAGCTGGCGCGCAACC
CCTTCAAGCAGCGCAGCCTGCAGCTGCAGGAGCAGATCCGCGCGCTCACGGGGAAGAAGTAC
GAGCTGACGGAGGAGGAGCGGCAGAGCAAGCGCTCGCCCGAGGAGCTGCGCGCCGACCTCAT
GGCCAAGATCAAGCGAGACAACACCGAGGTGGAGCAGATGACGCAGCAGATCCGCGAGCTTC
AGGACCAGATCAAGAAGATGGAGGAGCGCGTCAAGAGCCTGGGCGGCGCCACCAGCGGCGC
GGTGGCGGCGGAGGAAAAGGCCAACCGCGAGAAGTTTGAGGAGCTGTTGGCCAAGGAGCGC
CACCTAAACAACTTTATGGACGGCTTCCCCAGCCGCAAGGCCGCCAAGATGCAGGAGAAGCA
GCAGAAGGAGGACGGCATCGTGGGCGTGCTGGAGAAGATGGTGAAGATGCAGGGCATCATTG
GCTCCAACCTGCCCAGCCAGAAGAAGTACAAGGAAATGCAGGACGAGCTCGAGTACAAGAA
GATGCAGCTGGAGAACACGCAGACCACGCAGGAGCGGCTCAAGGAGGAGCTGACCATGCGG
CGCACAGAGCTGGAGAAGATCGATACGCTGGAGGACAAGATCAAGCTGGAGCTGACGCAGCT
GGCGGAGCGGCAGGAGGCCATGGAGAAGGAGATGGGCGAGTTCGGCAGCGTCGAGGACATC
CAGCGCAAGGCCAACGCCGCACGCGAGCGCATGGGGGCCTGCGCAGTGTGCTGTTTGAAGCG
CAAGGACCTGCTGCGCTCCATCGTGGCGGAGCGCGGCCTCAAGTTCCAGGCCAAGCGCGCGC
AGCTGCAGGACCACAACCTCCAGGTGCAGCTGGAGAAGATGGAGGCCAAGCTGAAGAATCTG
AGCGCGGGCGTATTCGAGATGGACGAGTTCATCAAGGCCAAGGAGAGCGAGACCAACTACCG
CCAGCTGGCCTCCAACATAGCGGCGCTGGTAGACGACCTCAACGTGCATGTCAAGAAGGCCG
TGGTGTAAGAAGGAGGCAGTGGTGTAAGGGGTCTCCGGAGGAGGGCGCGTGCCGTTGTTGGG
GTGTTGGGGGCGCGGCGCGAGAAGTACGTGCGTGTGGCGTTGTGCCTTTCAGCAGGCTGCACG
TGTAGTACGGTAGTCAAGGTGAAGGGCGGCCTGGGCACAGGAGGATGCTGACGCCGTGACGG
GTGACGATGACAGGCCATCGCGAGTTTGATCTCTGCTGTCGAGTCATTGACTTGGGTTCCTAG
ACAGGTCGGGCTACAAGCCCGGAGGTTGATGGCTCACCTCGCAGTGCGCGGACAGCAGGTGT
GGCGCATGCGCATGTGCCTCAGGAGCGCGGTGCGGACCAGGGAAGATGCGATGGGAGTAGGC
TAGGCCTGTGTGAGGGCCCTTGCCGAAGCGCCACGGCCATTCCATGGCCTGGCCCGAAGGCA
GCGCTCGTGGTTGGATACTGACCAGCGGCGTCAAGCGGCGTACGATGTCAGAAGTGGAGCTA
CCGCCCCTGCACAAGGGGTGATGTACATACTGTTATTTAGGAGTCCGCTGCTTATAGCTACTG
GACTGCAGAAGAAGGAGGCTGCAAGGATCTGATGGAGGCGCTGGTGTGTATGGATGACGCTG
TAAGAGATGCACAAGAGAAAAAAAAAAAAAAAAA (SEQ ID NO: 13)

FIG. 11B

Human

>Hs_IFT72 gi|13376669|ref|NP_079379.1| hypothetical protein FLJ22621
MEEVMNGYNMLKAQNDRETQSLDVIFTERQAKEKQIRSVEEEIEQEKQATDDIIKNMSLENQVKY
LEMKTTNEKLLQELDTLQQQLDSQNMKKESLEAEIAHSQVKQEAVLLHEKLYELESHRDQMIAED
KSIGSPMEEREKLLKQIKDDNQEIASMERQLTDTKEKINQFIEEIRQLDMDLEEHQGEMNQKYKEL
KKREEHMDTFIETFEETKNQELKRKAQIEANIVALLEHCSRNINRIEQISSITNQELKMMQDDLNFK
STEVQKSQSTAQNLTSDIQRLQLDLQKMELLESKMTEEQHSLKSKIKQMTTDLEIYNDLPALKSSG
EEKIKKLHQERMILSTHRNAFKKIMEKQNIEYEALKTQLQENETHSQLTNLERKWQHLEQNNFAM
KEFIATKSQESDYQPIKKNVTKQIAEYNKTIVDALHSTSGN (SEQ ID NO: 33)

FIG. 11C

IFT88

Chlamydomonas

>Cr_IFT88 predicted peptide
MSYGGTEEDDLYGGYDEQSNPLAGSGGAAFKALGADGAPPGTAMMGPPGTAMKSFVPGTA
MRGGTAMQQDPSLARPMTSNRGAGFTSAPNKKFDPLNRSMGSTLGSSGGGAMLVARKGDT
SPEEQARGMEKTVHELLEKSAADAAKNDINSALENAMEAKKNERKLCRFREQNNMADQIN
LELMYAVDFNLAHMYHMNKNYSEALNLYTAIVRNKNFPQSGWLRVNMGNIHFEQKKYPSA
IKMYRMALDQISATAKEVRFKIMRNIGLSFVRMGQYPDALQSFATVMDNVPDHQTGYNLV
MCNYALSDREGMKNAFIKLLKVSPSSEMDDDDDDDPMGDDDMQVMTMDDGLKDEMRKRNT
IITRLIVKAAQLISEKVDRANGFEGGFMWCCEQLRDAGYTKLANEVELAKATRFMGQKQF
DKAVGVFKDFEKKEPRVKARAATNLAFLYFLEGETDQADKYSEMALKSDRYNARAYVNKG
CVLVERGDLEGARSLFNEAAGIDPYCVEAIYNLGLVSQRLNELPYALAAFKKLHNMVPDN
VEVIHQIATTYDMMGDFKNAVKWFELLTSLVSNDPGVLARLGAIHARFDDEAKALHYYQE
SHRVYPVNMDVISWLGAYHVKSEVYEKAMPFFDLASKIQPQEVKWALMVASCYRRTNNLP
AALGKYKQIHTQHPDNVECLRYLVHLCSELGRRAEAAEYMTKLKKAEKAAVPEATTAAAP
AAAAAGSGMGGMGGLDDDIGSSAVSAQNRGKKMLVKEHMGGGGGKDNDDWGNEQLGDDLL
PM (SEQ ID NO: 16)

FIG. 12A

>Cr_IFT88 gi|11528334|gb|AF298884.1|AF298884 Chlamydomonas reinhardtii protein IFT88 (IFT88)
CGGCAACTTGACACTTGAGCTACTCGAAGGCAGGGCCGTGTGCAGAGCTCCTTCCCCACTATC
CTTCCTTTGCGTACCATACTTATCTTGCTAACAGCCTATAGAAGATGAGCTACGGGGGCACGG
AGGAGGATGACCTTTATGGAGGATATGATGAGCAATCGAACCCGCTTGCGGGCTCGGGTCGT
GCCGCATTTAAGGCACTTGGGGCCGATGGAGCTCCTCCAGGCACCGCCATGATGGGGCCGCCT
GGCACGGCCATGAAGAGCTTCGTGCCAGGCACGGCTATGCGGGGCGGCACGGCGATGCAGCA
GGACCCCAGCCTGGCGCGGCCTATGACCTCGAACCGGGGTGCTGGCTTCACGTCGGCGCCTAA
CAAGAAGTTTGACCCCCTCAATCGCTCAATGGGGTCGACACTGGGCTCGTCGGGGGGTGGCGC
AATGCTGGTGGCTCGCAAGGGTGACACCAGCCCGGAGGAGCAGGCGCGCGGGATGGAGAAG
ACGGTGCATGAGCTGCTTGAGAAGAGCGCGGCGGACGCGGCTAAGAATGACATCAACTCGGC
CCTGGAGAACGCCATGGAGGCGAAGAAGAATGAGCGAAAGCTGTGCCGCTTCCGGGAACAG
AACAACATGGCGGACCAGATCAACCTGGAGCTGATGTACGCCGTGGACTTCAACCTGGCACA
CATGTACCACATGAACAAGAACTACAGCGAGGCGCTGAACCTGTACACAGCCATCGTGCGCA
ACAAGAACTTCCCGCAGTCGGGTTGGCTGCGCGTCAACATGGGCAACATCCACTTCGAGCAG
AAGAAGTACCCCTCCGCCATCAAGATGTACCGCATGGCGTTGGACCAGATCAGCGCCACCGC
CAAGGAGGTCCGCTTCAAGATCATGCGCAACATCGGGCTGTCGTTCGTGCGCATGGGCCAGTA
CCCCGACGCGCTGCAGTCCTTCGCCACGGTCATGGACAACGTGCCCGACCACCAGACCGGCTA
CAACCTGGTCATGTGCAACTACGCGCTGAGCGACCGCGAGGGCATGAAGAACGCCTTCATCA
AGCTGCTCAAGGTGAGCCCATCCAGCGAGATGGATGACGATGACGACGACGACCCCATGGGC
GATGACGACATGCAAGTGATGACCATGGATGACGGGCTGAAGGACGAGATGCGCAAGCGCA
ACACCATCATCACGCGCCTCATTGTCAAGGCCGCGCAGCTCATCTCCGAGAAGGTGGATCGCG
CCAACGGCTTTGAGGGCGGCTTCATGTGGTGCTGCGAGCAGCTGCGCGACGCGGGCTACACC
AAGCTGGCCAACGAGGTGGAGCTGGCCAAGGCGACCCGGTTCATGGGGCAAAAGCAGTTTGA
CAAAGCCGTGGGCGTGTTCAAGGACTTTGAGAAGAAGGAGCCGCGCGTCAAGGCGCGCGCCG
CCACCAACCTGGCGTTCCTGTACTTCCTGGAGGGCGAGACCGACCAGGCCGACAAGTACAGC
GAGATGGCGCTCAAGAGCGACCGCTACAACGCACGAGCCTACGTCAACAAGGGATGCGTGCT
GGTGGAGCGCGGCGATCTGGAGGGAGCGCGAAGCCTGTTCAACGAGGCTGCCGGCATCGACC
CCTACTGCGTGGAGGCCATCTACAACCTGGGCCTGGTGAGCCAGCGCCTGAACGAGCTGCCGT
ACGCGCTGGCGGCGTTCAAGAAGCTGCACAACATGGTGCCCGACAACGTGGAGGTCATCCAC
CAGATCGCCACCACGTACGACATGATGGGCGACTTCAAGAACGCGGTCAAGTGGTTTGAGCT
GCTCACCTCGCTGGTCAGCAACGACCCCGGCGTGCTGGCGCGACTGGGAGCCATCCACGCCA
GGTTCGACGACGAGGCCAAGGCGCTGCACTACTACCAGGAGTCGCACCGCGTGTACCCGGTG
AACATGGACGTCATCTCCTGGCTGGGCGCCTACCATGTCAAATCGGAGGTGTACGAGAAGGC
CATGCCCTTCTTTGACCTGGCCTCCAAGATCCAGCCGCAGGAGGTCAAGTGGGCGCTCATGGT
GGCGTCCTGCTACCGCCGCACCAACAACCTGCCCGCCGCGCTGGGCAAGTACAAGCAAATCC
ACACGCAGCACCCCGACAACGTTGAGTGCCTGCGCTACCTGGTGCACCTGTGCTCCGAGCTGG
GCCGCCGCGCCGAGGCCGCCGAGTACATGACCAAGCTCAAAAAGGCGGAGAAGGCGGCGGT
GCCCGAGGCAACGACAGCGGCGGCGCCCGCCGCGGCCGCAGCTGGCAGTGGCATGGGTGGCA
TGGGCGGCCTGGACGACGACATTGGCAGCAGCGCGGTGTCGGCGCAGAACCGCGGCAAGAAG
ATGCTGGTCAAAGAGCACATGGGTGGCGGCGGTGGCAAGGACAACGACGACTGGGGAAACG
AGCAGCTTGGGGACGACCTGCTGCCCATGTAAACCGCAGTGCTGCCACAGGGCTTGGCGGGG
GCGGGGCGTCAGCGCAGCCAGTGGGGCTACCGCCGCGGCCTGGCGGAGGTGGCGGCGGCGCA
GCTGGCGGAGCCATGCGCGCCCAGGGCCAGGGGCTGTGGGGAGGTGATGGCGAGGGCGAGG
ACGACGACCACCTAAAAGCGCTGGGGCTGGGGGTGGGGTTGGTGGGCGGCCGCAGCGGGGGC
GCGCTGTCTGCCGGCACGGGGCGCGTGAAGGCCGATGTCAGCCGCGCCGCCTCTCACCCGGA
GTTCGGGGCCGAGCCTGCGTTTGGAAAGGTGCTGAGCTTTGGCTCGGCTGGGACGTCCAGCGC
ACTGCCTGAGCTGGCGTAAAGCCATTACCGCTGATGCAGCCCGCCATTCGTGTGTGTGCGTAT
ATGTGTGTGAATGTATGTGTGTGCTAGGTAAGCACGAGATGCGTGTGCGTTTGCTGGTTCGCG
CTGCGCCACTTTTGGCTGCAGGGGTCCCCAGGTCAGTGTGAAGCCCGGCCCGGGCGGAAATG
GGTGCATGGCAGTTGCGGCGCATGCATGCGGAAGTGAGCGAAGTGCAATAGGCTCCTGCAGG
GCATGGATGCGTAGGAACAGGGCTTGAATGATATCACTATGTGGCGTTGACGGGCCCACAAC
TTACATGGGAGAGGCACGCCGAAAGGGTGTGTGAGGATCAGGAGCTTGGACTTGCCGTAGTG
CTGTACATGGTGCCAGTCTACGTGCGGGCATAGACACATACAGGACCTGTGCTGCTGCGGAGT
CCGCATCTGCAGGAAGTCGTGCCGGGTGTCACGAGTGCGGACGATGCGGATTGTGGAGGAGT
ACAGATGGGGCCATCGGACATACTGGCACAGTGGCACCACCGGCCCCCTGCGACGCATGCTC
GCACGACCCTGTAAAGGTCGAGCCCAAAAAA (SEQ ID NO: 15)

FIG. 12B

Humans

>gi|5729800|ref|NP_006522.1| Tg737 protein; Probe hTg737 (polycystic kidney disease)
MMQNVHLAPETDEDDLYSGYNDYNPIYDIEELENDAAFQQAVRTSHGRRPPITAKISSTAVTRPIA
TGYGSKTSLASSIGRPMTGAIQDGVTRPMTAVRAAGFTKAALRGSAFDPLSQSRGPASPLEAKKK
DSPEEKIKQLEKEVNELVEESCIANSCGDLKLALEKAKDAGRKERVLVRQREQVTTPENINLDLTY
SVLSNLASQYSVNEMYAEALNTYQVIVKNKMFSNAGILKMNMGNIYLKQRNYSKAIKFYRMALD
QVPSVNKQMRIKIMQNIGVTFIQAGQYSDAINSYEHIMSMAPNLKAGYNLTICYFAIGDREKMKK
AFQKLITVPLEIDEDKYISPSDDPHTNLVTEAIKNDHLRQMERERKAMAEKYITTSAKLIAPVIETSF
AAGCDWCVEVVKASQYVELANDLEINKAVTYLRQKDYNQAVEILKVLEKKDNRVKSAAATNLS
ALYYMGKDFAQASSYADIAVNSDRYNPAALTNKGNTVFANGDYEKAAEFYKEALRNDSSCTEAL
YNIGLTYEKLNRLDEALDCFLKLHAILRNSAEVLYQIANIYELMENPSQAIEWLMQVVSVIPTDPQ
VLSKLGELYDREGDKSQAFQYYYESYRYFPCNIEVIEWLGAYYIDTQFWEKAIQYFERASLIQPTQ
VKWQLMVASCFRRSGNYQKALDTYKDTHRKFPENVECLRFLVRLCTDLGLKDAQEYARKLKRL
EKMKEIREQRIKSGRDGSGGSRGKREGSASGDSGQNYSASSKGERLSARLRALPGTNEPYESSSNK
EIDASYVDPLGPQIERPKTAAKKRIDEDDFADEELGDDLLPE (SEQ ID NO: 34)

FIG. 12C

Caenorhabditis elegans

>Ce_Osm-5 gi|12659061|gb|AAK01173.1|AF314195_1 OSM-5 [Caenorhabditis elegans]
MANSTFREDDDDFYGGFDSYDKAYDIQNITQNPQFQQAVARSSHGRRPTASQMGFRDASSSYGKP
PGTMMGNQSRMGGRTAMANNNEPARPMTAVRGAGYTSFANKVQAAERPLSTENSGENGEEKCR
QMENKVMEMLRESMLASEKKKFKEALDKAKEAGRRERAVVKHREQQGLVEMMNLDLTFTVLF
NLAQQYEANDMTNEALNTYEIIVRNKMFPNSGRLKVNIGNIHFRKREFTKALKYYRMALDQVPSI
QKDTRIKILNNIGVTFVRMGSYDDAISTFDHCVEENPNFITALNLILVAFCIQDAEKMREAFVKMIDI
PGFPDDDYMKEKDDDDVLLNQTLNSDMLKNWEKRNKSDAEKAIITAVKIISPVIAPDYAIGYEWC
LESLKQSVHAPLAIELEMTKAGELMKNGDIEGAIEVLKVFNSQDSKTASAAANNLCMLRFLQGGR
RLVDAQQYADQALSIDRYNAHAQVNQGNIAYMNGDLDKALNNYREALNNDASCVQALFNIGLT
AKAQGNLEQALEFFYKLHGILLNNVQVLVQLASIYESLEDSAQAIELYSQANSLVPNDPAILSKLA
DLYDQEGDKSQAFQCHYDSYRYFPSNLETVEWLASYYLETQFSEKSINYLEKAALMQPNVSKWQ
MMIASCLRRTGNYQRAFELYRQIHRKFPQDLDCLKFLVRIAGDLGMTEYKEYKDKLEKAEKINQL
RLQRESDSSQGKRHSANSTHSLPPSGLTGLGSGSGGSSGGGTRQYSAHVPLLLDSGTPFTVAQRDM
KAEDFSYDDPVAISSRPKTGTRKTTTDTNIDDFGDFDDSLLPD (SEQ ID NO: 35)

FIG. 12D

IFT122

Chlamydomonas

>Cr_IFT122 partial predicted peptide sequence (lacking N-terminal end)
HEGHFRRAPHFAYAKETLLKMDDTKGLITLYVEAEKWDDAFLLLHAHPECRQDVYLPYAKWLSN
QDRFDEARLAYQEGGFPSLATRILEQLCANAVVETRYADAAFYYYQLAMEALKSIKNPPSNMAPS
DRSALERFTELYDRAEVYYAYEVVHKSVHSPFRTTHPDTLFNASRFLLMRLLPPREVPLGVSVVN
VVYVLAKQAVEAGAFKLARFAYNKLQTLVLPAAWQAEVDLASVVIRSKPFSDKEDLLPVCWRCS
TTNPLLNTQGDYCINCGAPFIRSFVTFEHLPVVEFELEPGVDDEEAGRLLGEDAGMEAARRERKAE
RQAKAAEVGGNMLRLDQNEIDRMDDAFAAQMMVPNTTIRVDRAMLRRLKTAEVMVRTWPNPV
IPKQYFRSHGPGGAAVLQDPADTSSSRMSSRWRRWSVARRPSAAPPCAARAWRRARTPRMRVPA
ATSWAGRWAARVGPLGAPARRACPCPSSRAGRWCERGRLSGAYRVRGWIPDVGGE

(SEQ ID NO: 18)

FIG. 13A

>Cr_IFT122 partial cDNA sequence (lacking 5' end)
GGCACGAGGGCCACTTCCGCCGCGCGCCGCACTTTGCGTACGCCAAGGAGACGCTGCTCAAA
ATGGACGACACCAAGGGCCTGATCACGCTGTACGTGGAGGCTGAGAAGTGGGATGACGCCTT
CCTGCTGCTGCACGCGCACCCCGAGTGCCGGCAGGACGTGTACCTGCCCTACGCCAAGTGGCT
CAGCAACCAGGACCGCTTCGATGAGGCGCGGCTGGCGTACCAGGAGGGCGGCTTTCCCAGCC
TGGCCACCCGCATCCTGGAGCAGTTGTGCGCCAACGCGGTGGTAGAGACGCGGTACGCGGAC
GCCGCCTTCTACTACTATCAGCTGGCCATGGAGGCGCTCAAGAGCATCAAGAACCCGCCCTCC
AACATGGCGCCCTCGGACCGCTCCGCGCTGGAGCGCTTCACGGAGCTGTACGACCGCGCCGA
GGTGTACTACGCCTACGAAGTGGTGCACAAGTCCGTGCACTCGCCCTTCCGCACCACGCACCC
CGACACGCTCTTCAACGCCTCGCGCTTCCTGCTCATGCGCCTGCTGCCGCCGCGCGAGGTGCC
GCTGGGCGTCAGCGTGGTCAACGTGGTGTACGTGCTGGCCAAGCAGGCTGTCGAGGCGGGCG
CCTTCAAGCTGGCGCGCTTCGCGTACAACAAGCTGCAGACGCTGGTGCTGCCGGCGGCCTGGC
AGGCGGAGGTGGACCTGGCATCCGTGGTCATCCGCTCCAAGCCTTTCTCAGACAAGGAGGAC
CTGCTACCGGTGTGCTGGCGCTGCTCCACCACCAACCCGCTGCTCAACACGCAGGGCGACTAC
TGCATCAACTGCGGCGCGCCCTTCATCCGCTCCTTCGTCACCTTCGAGCACCTGCCCGTGGTGG
AGTTTGAGCTGGAGCCGGGCGTGGACGACGAGGAGGCGGGCCGCCTGCTGGGCGAGGACGCG
GGCATGGAGGCGGCGCGGCGCGAGCGCAAGGCGGAGCGGCAGGCCAAGGCGGCGGAGGTGG
GCGGCAACATGCTGCGGCTGGACCAGAACGAGATCGACCGCATGGACGACGCCTTCGCGGCC
CAGATGATGGTGCCCAACACCACCATCCGCGTGGACCGGGCCATGCTGCGGCGGCTCAAGAC
GGCCGAGGTCATGGTGCGCACCTGGCCCAACCCCGTCATCCCCAAGCAGTACTTCCGCAGTCA
TGGACCAGGAGGTGCCGCTGTGCTGCAGGACCCTGCGGACACTTCTTCGAGCAGGATGAGTTC
GAGATGGCGGCGCTGGAGCGTGGCACGGCGCCCTTCAGCCGCACCACCGTGCGCGGCGAGGG
CCTGGCGCCCGGGCGAGGACGCCGAGGATGAGGGTGCCGGCGGCAACAAGCTGGGCGGGCCG
TTGGGCAGCGCGCGTGGGCCCATTGGGGGCGCCAGCAAGGCGCGCATGTCCGTGCCCTTCCA
GCAGGGCCGGCCGCTGGTGTGAGCGGGGTCGCCTATCGGGCGCTTACCGGGTGCGTGGGTGG
ATTCCGGATGTAGGCGGGGAATAGGAGCTGCCGGTAGTGGCGTTGCAGCAGGCCTTCGTTAC
GCAGCAGAGGGGGCACGAGGAGGACGTGAACGGGTGTCTTCATGCTGCTTGTGGTCTGACTT
GGTAGGACGGGCGTTGGTGCCATCATTAGGCTGCCCCTGCCGGTCCACCATAGGAGCTGCGAT
GGGCCTGAAGCAAGGCCCATGCACGGTGGCCGGGCACATGATGCATGACGGGACAGAGCACG
GGACTTGCTGGAACCAGTGTACATATGCCCGCGCAGAGACTGCGTGTCTCGAAGCGGGCACA
AATTGGGACATGTCGGCGTACAGACAAACGATGATGATGACAGGATGACAGTTGTTGTGCGG
CAGGGGGGCTCCCAAGCCCAGTTGAGGCCCAGGCAGGTTTGGTTGAATGGGGATGCACAGTG
GCAGTGCTAATGCGCTGGCGCTATGAGCGTCCATGGTGTTGGCGGCCTCAAGTACAAGACACC
TTATAGTAGTTCAATCTGCCCCGCAAAAAAAAAAAAAAAAAA (SEQ ID NO: 17)

FIG. 13B

Human

>gi|11360072'pir||T43484 hypothetical protein DKFZp434K016.1 - human (fragment)
TLLQPLKGHKDTVYCVAYAKDGKRFASGSADKSVIIWTSKLEGILKYTHNDAIQCVSYNPITHQLA
SCSSSDFGLWSPEQKSVSKHKSSSKIICCSWTNDGQYLALGMFNGIISIRNKNGEEKVKIERPGGSLS
PIWSICWNPSSRWESFWMNRENEDAEDVIVNRYIQEIPSTLKSAVYSSQGSEAEEEEPEEEDDSPRD
DNLEERNDILAVADWGQKVSFYQLSGKQIGKDRALNFDPCCISYFTKGEYILLGGSDKQVSLFTKD
GVRLGTVGEQNSWVWTCQAKPDSNYVVVGCQDGTISFYQLIFSTVHGLYKDRYAYRDSMTDVIV
QHLITEQKVRIKCKELVKKIAIYRNRLAIQLPEKILIYELYSEDLSDMHYRVKEKIIKKFECNLLVVC
ANHIILCQEKRLQCLSFSGVKEREWQMESLIRYIKVIGGPPGREGLLVGLKNGQILKIFVDNLFAIVL
LKQATAVRCLDMSASRKKLAVVDENDTCLVYDIDTKELLFQEPNANSVAWNTQCEDMLCFSGG
GYLNIKASTFPVHRQKLQGFVVGYNGSKIFCLHVFSISAVEVPQSAPMYQYLDRKLFKEAYQIACL
GVTDTDWRELAMEALEGLDFETAKKAFIRVQDLRYLELISSIEERKKRGETNNDLFLADVFSYQG
KFHEAAKLYKRSGHENLALEMYTDLCMFEYAKDFLGSGDPKETKMLITKQADWARNIKEPKAAV
EMYISAGEHVKAIEICGDHGWVDMLIDIARKLDKAEREPLLLCATYLKKLDSPGYAAETYLKMGD
LKSLVQLHVETQRWDEAFALGEKHPEFKDDIYMPYAQWLAENDRFEEAQKAFHKAGRQREAVQ
VLEQLTNNAVAESRFNDAAYYYWMLSMQCLDIAQDPAQKDTMLGKFYHFQRLAELYHGYHAIH
RHTEDPFSVHRPETLFNISRFLLHSLPKDTPSGISKVKILFTLAKQSKALGAYRLARHAYDKLRGLYI
PARFQKSIELGTLTIRAKPFHDSEELVPLCYRCSTNNPLLNNLGNVCINCRQPFIFSASSYDVLHLVE
FYLEEGITDEEAISLIDLEVLRPKRDDRQLEIANNSSQILRLVETKDSIGDEDPFTAKLSFEQGGSEFV
PVVVSRLVLRSMSRRDVLIKRWPPPLRWQYFRSLLPDASITMCPSCFQMFHSEDYELLVLQHGCCP
YCRRCKDDPGP (SEQ ID NO: 36)

FIG. 13C

Caenorhabditis elegans

>Ce_Daf10 Z82266 F23B2.4
MTMKKISRKLGFHGEQVCIYDLAFKPDGSELLLAADNKVYLFDVNEGGQMQTLKGHKDLVYTV
AWSHNGELFASGGADKLVILWNEKHEGTLRYSHTDVIQCMMFNPCNQILLTCALNEFGLWSTAD
KNVIKQRSVVRCCSCAWNTDGTIFAIGHGDGTITLRKGTNATEEPSIIIQRDNEPIWGIAFSSNRTFA
SRDSQGNPMGIDEIMAVIDWNKTLSFYSLDGTFIESKNLEFEPHCISYCLNGEYLLIGGSDKILKIYT
RKGVLLGTVAQMDHWIWSVTVRPNSQTVAMGCVDGTIACYNLVFSTVHCVDHARYANRKSMT
DVFVQNLEYRTSSNICCHDLVKKMSLYDTKLAVQLSDKIQIYKQTGGVSKNERRKQLKYTLQDTI
RKDLSFSLMVVTHGHLVVCNDEKLECYDFKGIKKRSWNMKSIVRYLRVLGGPAHRETLVLGTTD
GGVYKVFIDNDYPILLDSRKTAIKCIDINANRTVLASIEDTLVCKWSDIATGETLLQEPGCYSVVFN
TVNENLFAFTTNNMLHVRTLAAPGHTTRGVGYVLGFVKNRTFCLVQYNLIPLEVPYTIHLYQYIER
GDFKEALRIACLGVVKNDWKYLANKALDALEFDVARKAYKRVRDRKMLRMVWELKKMKSNG
EPDAILRATILAYTKKFREAAKIFKENGFENRAMELFTDMRMFDDVQEVMTTASGETKKMLMRK
RASWARDANQPKIAAEMLISSGDLDKAALLIIDNDWLELAIEISHKIDRSDLETMKKLSAYFIRKHE
FGLASRIFQSINDMKSIVDMHVNAGHWTDAFAIADRHPKYVEDVYLPYARFLAERDRFEEAQKAF
HRAGKEQEAMHVLEQLTSNSVNENRFADAGCGLNNPLLGGMSCIHCETPFIISFVSFDILPLIEFKIE
NDISFDEAKELIESEPPLSDDDYNPLRGLKKGIKEIILNRESLSKLEQGHVIIQTFPPPLAPKFLFNVMP
SITIAQCKGCNKVFDLDDFEMACLRKGHCPFCRTSYDRNEAFFVDEEEDEDNTNIPSFGQFSRFS

(SEQ ID NO: 37)

FIG. 13D

IFT139

<u>*Chlamydomonas*</u>

>Cr_IFT139 partial predicted peptide sequence (lacking C-terminal end)
MADRVLALVHYYAREGYFRHVQTVCNEVLKKRPGDGVLTFWRAYGLLMEGNTADAMRDLSSIQ
GNSDLELAVAAAQLLGHESAKVPDHDAIIDLQAKLEIEERTASDQPCLHLASFYLYTKSKERARGL
VERVLRNQPDMVPAQVLLGWIIISQQQDDEYDMLFDESELDDALSHFEQAVEHDHNDLQALLGK
AKIMELKKQLGPCLDVLTEINVRFGWFVPALVEKTRMLMMLGDWEQVTETLQRVLAADQQNIM
AQAWNCMISLTREGNNKQAAKQLQDLFSSMNRQEPKNAELFFRVARPFGRLACSDPTLLGITYLM
ADRAAQLRPEMAAYVVEAAAQKLMMDETTNATERFTQALQLDELNLEANAGALEAQIMAGELE
EAAGQIMFLEDMFTNAAAAGGGKRKGRGTGDMDDDPDMADPSLGTSSDNPTLLYLKGLLAWKQ
GMPSEGLGLLERSIAALFSAAADFHGPSLELYAALNPARITAMVRLLLQSIGGEPRAPTEAPSPLISK
VTRALDLLNKQAPALQESALLHARALYLNGNLDGALRKAGEILRMNPEESSAHLLICSVYVAQDK
PELAVSALDQAVSSNFAIRETPLYHVVQAKVLVANNKLDDAKRVLESAMNLPGVRTALTVQQRA
RLGRKVVEPTLHERATVYLLLADVLARQSKIPDAPEAKKYIQDAIREFEGTSEEVRVTVADCELAI
ARGDVEGALKKLRRIPKESPHYVKARMAMADIYLRHIRKDKAAYIKCYMDLVDHTPDYDSYCML
GEAFMQIQEPEKAVRA (SEQ ID NO: 20)

FIG. 14A

>Cr_IFT139 partial Cdna sequence (lacking 3' end)

GGGTAGTCGTAACGTCTCAAGTATCGGACGCACTATTTGCAACTGCTTATTTTCGCATGGCTCC
CCCATCAATGAACTTGCTTCGTCCCTATGGCCTCCCATCGAGCGTGCAAGGTATCACCGTGTAT
ACACATGCTAAATATACTTCGTTAAATTGGAGTTCACCGCGGAGGCCTGAACATTTGCCGAAC
CGCTCCTGAGGAAGCAGAACGAATAGCAGTGCATACAAATAGCCATGGCGGACAGGGTACTT
GCCCTGGTCCATTACTATGCTCGCGAGGGCTATTTTAGACATGTGCAGACGGTGTGCAACGAA
GTGCTCAAGAAGCGGCCGGGAGATGGCGTACTCACATTCTGGCGTGCCTATGGACTGCTCATG
GAGGGCAACACGGCGGACGCCATGCGTGACCTCTCCAGCATCCAGGGCAATTCTGACCTTGA
GCTGGCGGTCGCAGCCGCGCAACTACTGGGTCACGAATCCGCCAAGGTGCCCGACCACGATG
CCATCATTGACCTCCAAGCCAAGCTGGAGATCGAGGAGCGCACCGCCAGCGACCAGCCCTGC
CTGCACCTGGCCTCCTTCTACCTGTATACCAAGTCCAAGGAGCGCGCCCGCGGTCTGGTGGAG
CGCGTGCTGCGCAACCAGCCCGACATGGTGCCGGCGCAGGTTCTTCTGGGCTGGATCATCATC
AGCCAGCAGCAGGACGACGAGTACGACATGCTGTTTGACGAGTCCGAGCTGGACGACGCCCT
CAGCCACTTCGAGCAGGCGGTGGAGCACGACCACAACGACCTGCAGGCGCTGCTGGGCAAAG
CCAAGATCATGGAGCTGAAGAAGCAGCTGGGGCCCTGCCTGGACGTGCTGACGGAGATCAAC
GTGCGCTTCGGCTGGTTCGTGCCGGCGCTGGTGGAAAAGACGCGCATGCTCATGATGCTGGGC
GACTGGGAGCAGGTGACGGAGACGCTGCAGCGGGTGCTTGCGGCGGACCAACAGAACATCAT
GGCGCAGGCCTGGAACTGCATGATCTCCCTCACTCGCGAGGGCAACAACAAGCAGGCGGCCA
AGCAGCTGCAGGACCTGTTCAGCTCAATGAACCGCCAGGAGCCCAAGAACGCCGAGCTCTTC
TTCCGCGTCGCCCGGCCCTTCGGCCGCCTGGCCTGCAGCGACCCCACGCTGCTGGGCATCACC
TACCTCATGGCCGACCGCGCCGCGCAGCTCAGGCCGGAGATGGCGGCCTACGTGGTGGAGGC
AGCTGCTCAGAAGCTGATGATGGACGAGACCACCAACGCCACGGAGCGCTTCACGCAGGCGC
TACAGCTGGACGAGCTGAACCTGGAGGCCAACGCGGGCGCGCTGGAGGCGCAGATCATGGCG
GGCGAGCTGGAGGAGGCGGCGGGGCAGATCATGTTCCTGGAGGACATGTTCACCAACGCCGC
GGCGGCTGGCGGCGGCAAGCGCAAGGGCCGCGGCACCGGCGACATGGACGACGACCCCGAT
ATGGCCGACCCCAGTCTGGGCACCTCCTCCGACAACCCCACGCTGCTCTACCTCAAGGGTCTG
CTGGCCTGGAAGCAGGGCATGCCGTCCGAGGGCCTGGGTCTGCTGGAGCGCTCCATTGCCGCC
CTGTTCTCCGCCGCCGCCGACTTCCACGGCCCCAGCCTGGAGCTGTACGCGGCGCTCAACCCG
GCGCGCATCACCGCAATGGTGCGGCTGCTGCTGCAGAGCATCGGCGGTGAGCCGCGCGCTCC
CACTGAGGCGCCGTCTCCGCTCATCAGCAAGGTCACCCGCGCGCTGGACCTGCTGAACAAGCA
GGCGCCGGCGCTGCAGGAGAGCGCGCTGCTGCACGCGCGCGCGCTGTACCTGAACGGCAACC
TGGACGGCGCGCTGCGCAAGGCGGGCGAGATCCTGCGCATGAACCCCGAGGAGAGCTCCGCG
CACCTGCTCATCTGTTCCGTGTACGTGGCGCAGGACAAGCCCGAGCTGGCCGTCAGCGCGCTG
GACCAGGCCGTCAGCAGCAACTTCGCGATCCGCGAGACGCCTCTGTACCACGTGGTCCAGGCC
AAGGTGCTGGTGGCCAACAACAAGCTGGACGACGCCAAGCGCGTCCTGGAGTCCGCCATGAA
CCTGCCGGGCGTGCGCACAGCGCTCACCGTGCAGCAGCGCGCGCGACTAGGGCGCAAGGTGG
TCGAGCCCACGCTGCACGAGCGCGCCACCGTGTACCTGCTGCTGGCGGACGTGCTGGCGAGG
CAGTCCAAGATACCGGACGCACCAGAGGCCAAGAAGTACATCCAAGACGCCATCCGCGAGTT
CGAGGGCACCAGCGAGGAGGTGCGCGTCACGGTGGCGGACTGCGAGCTGGCCATTGCGCGCG
GCGACGTGGAGGGCGCGCTCAAGAAGCTGCGGCGCATCCCCAAGGAGTCTCCGCACTACGTG
AAGGCGCGCATGGCCATGGCCGACATCTACCTGCGCCACCGCAAGGACAAGGCCGCCTACAT
CAAGTGCTACATGGACCTGGTGGACCACACGCCCGACTACGACAGCTACTGCATGCTGGGCG
AGGCGTTCATGCAGATCCAGGAGCCGGAGAAGGCAGTGCGCGCT (SEQ ID NO: 19)

FIG. 14B

Human

>Hs_IFT139-1 ref|NT_005498.3|Hs3_5655 Homo sapiens chromosome 3
SFIQAGIIYYSQEKYFHHVQAAAVGLEKFSNDPVLKFFKAYGVLKEDREAIQELEYSLKEIRKTVSG
TALYYAGLFLWLIGRHDKAKEYIDRMLKISRGFREAYVLRGWVDLTSDKPHTAKKAIEYLEQGIQ
DTKDVLGLMGKAMYFMMQQNYSEALEVVNQITVTSGSFLPALVLKMQLFLARQDWEQTVEMG
HRRILEKDESNIDACQILTVHELAREGNMTTQATNHVRNLIKALETREPENPSLHLKKIIVVSRLVC
GSHQVILGLVCSFIERTFMATPSYVHVATELGYLFILKNQVKEALLWYSEAMKLDKDGMAGLTGII
LCHILEGHLEEAEYRLEFLKEVQKSLGKSEVRAPWGYGLLQDDVLCCPPTPTFQCKVAWTFTLPLP
TKSAQADIGTETRSSLPQVLIFLQALLMSRKHKGEEETTALLKEAVELHFSSMQGIPLGSEYFEKLD
PYFLVCIAKEYLLFCPKQPRLPGQIVSPLLKQVAVILNPVVKAAPALIDPLYLMAQVRYYSGELEN
AQSILQRCLELDPASVDAHLLMCQIYLAQGNFGMCFHCLELGVSHNFQVVRDHPLYHLIKARALN
KAGDYPEAIKTLKMVIKLPALKKEEGRKFLRPSVQPSQRASILLELVEALRLNGELHEATKVMQDT
INEFGGTPEENRITIANVDLVLSKGNVDVALNMLRNILPKQSCYMEAREKMANIYLQTLRDRRLYI
RCYELCEHLPGPHTSLLLGDALMSILEVSERPHSLAKWPPSLPSPVGEKRKTQRHFPHQPEKALEV
YDEAYRQNPHDASLASRIGHAYVKAHQYTKAIEYYEAAQKINGQDFLCCDLGKLLLKLKKVNKA
EKVLKQALEHDIGVQDIPSMMNDVKCLLLLAKVYKSHKKEAVIETLNKVIDRWTQALALDLQSRI
LKRVPLEQPEMIPSQKQLAASICIQFAEHYLAEKEYDKAVQSYKDVFSYLPTDNKVLMADLMFRK
QKHEAAINLYHQVLEKAPGDNFLVLHKLIDLLRRSGKLEDIPAFFELAKKVSSRVPLEPGFNYCRGI
YCWHIGQPNEALKFLNKARKDSTWGQSAIYHMVQICLNPDNEVVGGEAFENLIPRSNTCSYMEKK
ELEQQGVSTAEKLLREFYPHSDSSQTQLRLLQGLCRLATREKANMEAALGSFIQIAQAEKDSVPAL
LALAQAYVFLKQIPKARMQLKRLAKTPWVLSEAEDLEKSWLLLADIYCQGSKFDLALELLRRCVQ
YNKAQSCYKAYEYMGFIMEKEQSYKDAVTNYKLAWKYSHHANPAIGKATSQGARETWEGGGQ
EPHHDPRTQGLYPGCYENQRGSQVTRVPPSLLSMSPVGFKLAFNYLKDKKFVEAIEICNDVSQQP
WWGGPGVVVGNPA (SEQ ID NO: 38)

FIG. 14C

>Hs_IFT139-2 ref|NT_005239.3|Hs2_5396 Homo sapiens chromosome 2
INYYCQERYFHHVLLVASEGIKRYGSDPVFRFYHAYGTLMEGKTQEALREFEAIKNKQDVSLCSLL
ALIYAHKDREAILESDARVKEQRKGAGEKALYHAGLFLWHIGRHDKAREYIDRMIKISDGSKQGH
VLKAWLDITRGKEPYTKKALKYFEEGLQDGNDTFALLGKVSWRQNYSGALETVNQIIVNFPSFLP
AFVKKMKLQLALQDWDQTVETAQRLSNKIIFFSFCGRSQLILQKIQTLLERAFSLNPQQSEFATELG
YQMILQGRVKEALKWYKTAM TLDETSVSALVGFIQCQLIEGQLQDADQQLEFLNEIQQSIGKSAV
LIYLHAVLAMKKNKRQEEVINLLNDVLDTHFSQLEGLPLGIQYFEKLNPDFLLEIVMEYLSFCPMQ
VSNYGFLLGDIEAAFNNLQHCLEHNPSYADAHLLLAQVYLSQEKVKLCSQSLELCLSYDFKVQVR
DYPLYHLIKAQSQKKMGEIADAIKTLHMAMSLPGMKRIGASTKSKDRKTEVDTSHRLSIFLELIDV
HRLNGEHEATKVLQDAIHEFSGTSEEVRVTIANADLALAQGDIERALSILQNVTAEQPYFIEAREK
MADIYLKHRKDKMLYITCFAITYYEAALKTGQKNYLCYDLAELLLKLKWYDKAEKVLQHALAH
EPGMKARELQARVLKRVQMEQPDAVPAQKHLAAEICAEIAKHSVAQRDYEKAIKFYREALVHCE
TDNKVDNYMTLSRLIDLLRRCGKLEDVPRFFSMAEKRNSRAKLEPGFQYCKGLYLWYTGEPNDA
LRHFNKARKDRDWGQNALYNMIEICLNPDNETVGGEVFENLDGDSNSTEKQESVQLAVRTAEKL
LKELKPQTVQGHVQLRIMENYCLMATKQKSNVEQALNTFTEIAASEKEHIPALLGMATAYMILKQ
TPRARNQLKRIAKMNWNAIDAEEFEKSWLLLADIYIQSAKYDMAEDLLKRCLRHNRSCCKAYEY
MGYIMEKEQAYTDAALNYEMAWKYSNRTNPAVG (SEQ ID NO: 39)

FIG. 14D

Caenorhabditis elegans

>gi|7511091|pir||T29012 hypothetical protein ZK328.7 - Caenorhabditis elegans
MKVAANELAISTIHFLPGHIEKAKASIMMKDWRGVMDCIMNADQPEGSNPYIEVLRTVHGICYAG
EVSMLKRTLQLLLKSLDENEATNHVLYARITKLLVSISGRDEKILRHARDFLTRALKISRKPDYVAL
SMRIAFGLGGAKEVSTLSQELVALDCEDSYAVLSSVVSMLMISRVSDARAQFDILPSAHPKLLESPL
YYLIASVLAKQSKDKSFENFRQHIENLVEMLRNQLQSFPFGLDYLSLFSSDLLYSAVEQCFDFYPLV
PIKAPDDCMKLTAKTLQMIYDVAPGLAHCTLQLARNSYLCSNTNAAEKWIEKVLDKDDSLADAHI
LRAELILDRGGKITDADDALVTGLNFNFKLRETSLYHLIKSKTFKKRNENDEAIKTLKMALQIPRKE
PSKNLFQPKESADTHKISVQLELIDTLQHMKRIQEAETTMTDALAEWAGQPEQDQLVIAQAQLYL
TKGHVERALGILKKIQPGQSNFHLSRIKMAEIYLEEKKDKRMFAACYRELLKVEATPGSYSLLGDA
FMKVQEPEDAINFYEQALKMQSKDVQLAEKIGEAYVMAHLYSKAVNFYESSMNIYKDKNMRLK
LANLLLKLRNFEKCEKVLRAPFERDPEPVGTETIQTYIQFLLLLAECHEMMDNVPEAMNDFEKAKS
LHSRIQDKTLTAALKKEGARICNLQAELLYRRREFSQAVDICKQALAYHETDLKANLLLSKIFKEE
NKWTLVLQPCQTVIQVDPHNDEANSILADFYYIRSEAAHASTSYTTLLNTNPQHWHALSRVVELF
CRNGEQNAAEKHLDRAKEVNPRCVTESGYNVCRGRFEWYTGDQNEALRYYSRTKDSAAGWREK
ALYYMIDICLNPDNEIIIDENSVENPETTKIIYLVSELWKKLVNSKNLPNITSIYSENFQSTDRFLLAQ
NFIRMHTTDKSAIQAALDEFNRMAFNADRSQVTNVGAVFGVARGHVLLKQVQKAKTVLKMVNG
RVWNFDDSDYLEKCWLMLADIYINQNKNDQAVTFLDLVFKYNCNCLKAFELYGYMREKEQKYV
EAYKMYEKAFMATKERNPGFGYKLAFTYLKAKRLFACIETCQKVLDLNPQYPKIKKEIMDKAKA
LIRT (SEQ ID NO: 40)

FIG. 14E

Che-2

Chlamydomonas

>Cr_Che-2 predicted peptide sequence
MRLKVKQSSANVHSELTAAVGWNVWNELFTCSDDQTIHKWNMLGEPEQKVSTLDAYFTDMHW
YPVSSKKTQAGGTDVFAVACTDGSVKILSRTGRVEKSIEGHKGACISLRWSYDGTALATAGEDGS
VKIWSRNGMLRSTLAQADSPVYSIVWAYDCDQLCYCTGSNVVIKSLSSNAKQNAWKAHDGVVL
KVDWSPINHLIITGGEDCKYKVWDSFGRLLFQSGLFDYPVTSVAWAPSGELFAVGGFNTLQLCDR
MGWAYSKIHLNDTGSIMTLSWTADSTQLAGGGGSGGVVFGQVVDLALEDGKMQVTVVDDMRIV
VNDILNENADELPEFRDRVIKVSLGYGYLIVATATQCHVYNTTNLGTPHIFDLKDTVTLLLQAERH
FLLLDNSAGIQIYTYEGRQICNPRFQGLRTELLNAQMITLSNDTIAVLDQQASGTTVRFFDTAQGRP
VGEPWQHTLEVKEIALSQAGTINDRQLIVIDRNRDLYLLPVMKRHVAKLAAMCDSARWHDSTAM
LSAMVDQRLCVWYYPSEVYVDKDLLAKTRYTKSDSDFGKSAQIQLFAGNRCLVRRSDGVLVSAA
TSPYPAVLYDMIRKQQWDKATRLCRFIKDPTMWATLAAMAMAAKELNTAEVAFAAIDEVDKTH
FVRKVKQIPTEEGRNAELAVYRRKPEEGESILLQAGLVFRAIKLNIKLFNWERALXLATQHKQHQD
TVLWYRQQFLKNAKLAESITRFMQMNESVVVDQAAVKKKIEEERIKESQRPGAKRYV

(SEQ ID NO: 22)

FIG. 15A

>Cr_Che-2 cDNA sequence
ATGCGTCTCAAGGTCAAGCAGTCCAGCGCGAATGTGCACAGCGAATTAACAGCAGCTGTGGG
CTGGAATGTCTGGAATGAACTGTTCACTTGTAGCGACGACCAGACTATTCACAAATGGAACAT
GCTGGGGGAGCCAGAGCAGAAGGTCAGCACTCTGGACGCATACTTCACGGATATGCACTGGT
ACCCCGTGAGCTCGAAGAAGACGCAAGCAGGCGGGACGGACGTATTCGCGGTGGCGTGCACA
GACGGCTCTGTAAAAATCCTCAGCCGCACGGGCCGCGTGGAGAAGTCCATTGAGGGGCACAA
GGGCGCGTGCATCTCGCTGCGCTGGAGCTATGACGGGACGGCACTGGCGACGGCGGGCGAGG
ACGGGTCGGTAAAGATCTGGTCGCGCAACGGCATGCTGCGCTCCACGCTAGCGCAGGCGGAC
AGCCCCGTGTACTCGATTGTGTGGGCCTACGACTGCGACCAGCTGTGCTACTGCACCGGCTCC
AACGTGGTCATCAAGTCGCTGTCCTCCAACGCCAAGCAGAACGCGTGGAAGGCGCACGACGG
CGTGGTGCTCAAGGTGGACTGGAGCCCCATCAACCACCTCATCATCACAGGCGGCGAGGACT
GCAAGTACAAGGTGTGGGACAGCTTTGGGCGGCTGCTGTTCCAGAGCGGGCTGTTCGACTACC
CGGTCACGTCGGTGGCGTGGGCGCCCAGCGGCGAGCTGTTCGCGGTGGGCGGCTTCAACACG
CTGCAGCTGTGTGACCGCATGGGCTGGGCCTACTCCAAGATCCACCTCAACGACACGGGCAGC
ATCATGACTCTGAGCTGGACGGCGGACAGCACGCAGCTGGCGGGCGGCGGCGGCAGCGGCGG
CGTGGTGTTCGGCCAGGTGGTGGACCTGGCGCTGGAGGACGGCAAGATGCAGGTGACGGTGG
TGGACGACATGCGCATTGTGGTGAACGACATCTTGAACGAGAACGCGGACGAGCTGCCCGAG
TTCCGTGACCGCGTCATCAAGGTGTCGCTAGGGTACGGCTACCTGATCGTGGCCACCGCGACG
CAGTGCCACGTGTACAACACCACCAACCTGGGCACGCCGCACATCTTTGACCTCAAAGACACG
GTCACCCTGCTGCTGCAGGCTGAGCGGCACTTCCTGCTGCTGGACAACTCGGCGGGCATCCAG
ATCTACACCTACGAGGGCCGCCAGATCTGCAACCCGCGCTTCCAGGGCCTGCGCACCGAGCTG
CTGAACGCGCAGATGATCACGCTGTCCAACGACACGATAGCGGTGCTGGACCAGCAGGCCAG
CGGCACCACCGTGCGCTTCTTCGACACGGCGCAGGGCCGGCCAGTGGGCGAGCCGTGGCAGC
ACACGTTGGAGGTGAAGGAGATCGCGCTGAGCCAGGCCGGCACCATCAACGACCGCCAGCTC
ATCGTCATCGACCGCAACCGCGACCTGTACCTGCTGCCCGTCATGAAGCGCCACGTGGCCAAG
CTGGCGGCCATGTGCGACTCGGCGCGCTGGCACGACAGCACCGCCATGCTGTCCGCCATGGTG
GACCAGCGCCTGTGTGTGTGGTACTACCCCAGCGAGGTGTACGTGGACAAGGACCTGCTGGCC
AAGACGCGCTACACCAAGTCCGACTCGGACTTTGGCAAGTCGGCCCAGATCCAGCTCTTCGCC
GGCAACCGCTGCCTGGTGCGCCGCTCCGACGGCGTGCTGGTCTCCGCCGCCACCTCGCCCTAC
CCTGCCGTACTGTACGACATGATCCGCAAGCAGCAGTGGGACAAGGCCACGCGGCTGTGTCG
CTTCATCAAGGACCCCACCATGTGGGCCACGCTGGCGGCGATGGCCATGGCGGCTAAGGAGC
TGAACACGGCGGAGGTGGCGTTCGCGGCGATTGACGAGGTGGACAAAACGCACTTTGTGCGC
AAGGTGAAGCAGATCCCCACGGAGGAGGGCCGCAACGCCGAGCTGGCGGTGTACCGGCGCA
AGCCCGAGGAGGGCGAGTCCATACTGCTGCAGGCCGGCCTGGTCTTCCGCGCCATCAAGCTG
AACATCAAGCTGTTCAACTGGGAGCGCGCGCTGSACCTGGCCACGCAGCACAAGCAGCACCA
GGACACGGTGCTGTGGTACCGCCAGCAGTTCCTCAAGAACGCCAAGCTCGCCGAGTCCATCAC
GCGCTTCATGCAGATGAACGAGTCGGTGGTTGTGGACCAGGCGGCGGTGAAGAAGAAGATCG
AGGAGGAGCGCATCAAGGAGTCGCAGCGGCCAGGCGCCAAGCGCTACGTGTAA

(SEQ ID NO: 21)

FIG. 15B

Human

>Hs_Che-2 gi|7243129|dbj|BAA92612.1| KIAA1374 protein [Homo sapiens]
IELVSCVGWTTAEELYSCSDDHQIVKWNLLTSETTQIVKLPDDIYPIDFHWFPKSLGVKKQTQAESF
VLTSSDGKFHLISKLGRVEKSVEAHCGAVLAGRWNYEGTALVTVGEDGQIKIWSKTGMLRSTLA
QQGTPVYSVAWGPDSEKVLYTAGKQLIIKPLQPNAKVLQWKAHDGIILKVDWNSVNDLILSAGED
CKYKVWDSYGRPLYNSQPHEHPITSVAWAPDGELFAVGSFHTLRLCDKTGWSYALEKPNTGSIFN
IAWSIDGTQIAGACGNGHVVFAHVVEQHWEWKNFQVTLTKRRAMQVRNVLNDAVDLLEFRDRV
IKASLNYAHLVVSTSLQCYVFSTKNWNTPIIFDLKEGTVSLILQAERHFLLVDGSSIYLYSYEGRFIS
SPKFPGMRTDILNAQTVSLSNDTIAIRDKADEKIIFLFEASTGKPLGDGKFLSHKNEILEIALDQKGL
TNDRKIAFIDKNRDLCITSVKRFGKEEQIIKLGTMVHTLAWNDTCNILCGLQDTRFIVWYYPNTVY
VDRDILPKTLYERDASEFSKNPHIVSFVGNQVTIRRADGSLVHISITPYPAILHEYVSSSKWEDAVRL
CRFVKEQTMWACLAAMAVANRDMTTAEIAYAAIGEIDKVQYINSIKNLPSKESKMAHILLFSGNI
QEAEIVLLQAGLVYQAIQININLYNWERALELAVKYKTHVDTVLAYRQKFLETFGKQETNKRYLH
YAEGLQIDWEKIKAKIEMEITKEREQSSSSQSSKSIGLKP (SEQ ID NO: 41)

FIG. 15C

Caenorhabiditis elegans

>Ce_Che-2 gi|4468141|emb|CAB38019.1| CHE-2 protein [Caenorhabditis elegans]
MKLKLSASRKTRHTEMVCGVGWIGTEAILSAADDHVFLLTNTATNESQQILNMPETFFPTSLHIFP
RSQTKGGQNDVFAVSTSDGKINILSRNGKVENMVDAHNGAALCARWNSDGTGLLSSGEDGFVK
MWSRSGMLRSVLAQFATAVYCVAWDSTSSNVLYCNADHCYIKSLKMQVAPIKWKAHDGIILCCD
WNPTSDLIVTGGEDLKFKVWDGFGQILFNSSVHDYPITSISWNTDGTLFAVGSHNILRLCDKSGWS
HSLEKMNAGSVMALSWSPDGTQLAVGTAAGLVFHAHIIDKRLTYEEFEIVQTQKTVIEVRDVSSE
VSRETLETKERISKIAILYKYLIVVTSSHIYIYSSKNWNTPTMIEYNERTVNIIVQCEKIFLVSDGMTIT
IFTYEGRKLINLNPPGQVMALLDERKIDLANDTLVVRDRADNKVLHFFDPTTGKAQGDGNLKHEH
DIVELTVNQCGPLNDRNVAFRDQIGAVHIAMVKTFGVSQRMVKIGSLVEQLVFNDVTNMLCGISE
GKIAVWPLPNVAFHDRNLLQKSLIQKNIGSVGKFPQLANFAGNTIVIRKSDGCLLPTGILPFYGTLIT
MASQSKWDQAIRLCRSIGNDTMWATFAGLAVLHKNMIVMEIAYAALEDDEKVSLINEIKDKTDK
ETRQAMQVVLTGKLADADVLLERSGLSFRSLMLNIQMFKWKRALELGLKNKQWLEIVMGYREK
YLKNCGQKETDPLFLKHMSEVEIDWVHIRELIAAEKAKGNN (SEQ ID NO: 42)

FIG. 15D